INSTRUCTION BOOK

112 INCH WHEELBASE

Ford

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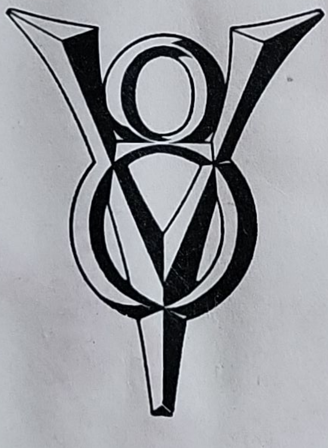

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FOREWORD

This book contains information necessary to the proper care and operation of the Ford car. For your convenience we have combined suggestions for the operation of the car as well as for the avoidance of most of the more common abuses in one article under the heading "The Owner's Responsibilities" (see page 6). Read it carefully, attention to the suggestions offered will go far to increase your enjoyment and satisfaction with the car.

Complete driving instructions are outlined on page 13.

To insure uninterrupted service, it is recommended that you have your lubrication and maintenance work done by an authorized Ford dealer; however, for the owners who are unable to take their car to an authorized Ford dealership for lubrication and maintenance service, instructions have been combined in one article, starting on page 14, which will lessen the possibility of any points being overlooked.

The various units of the car are explained in detail, starting on page 24.

When repairs or replacements are necessary, it is important that you use genuine Ford parts and have the work performed by competent mechanics. Expert workmanship is just as essential in the servicing of your car as it is in building it. Factory trained mechanics are employed by authorized Ford dealers and only genuine parts are used

Specifications and License Data

Engine:	90 degree, 8-cylinder, V-type Cylinder Bore.................$3\frac{1}{16}$ inch Stroke........................3¾ inch Horsepower (S.A.E. rating)..........30
Transmission:	Synchronized selective sliding type with helical constant mesh gears in second speed. Three speeds forward, and reverse.
Clutch:	Single plate cushion type dry disc with mechanical damper.
Brakes:	Four wheel, internal expanding brakes operated by the foot brake pedal and the hand brake lever. Total braking surface 186 square inches.
Steering Gear:	Semi-reversible—hour glass worm and sector type. Ratio 13 to 1.
Oiling System:	Engine lubricated by positive displacement gear pump direct to crankshaft main and connecting rod bearings, and camshaft bearings, by splash to balance of engine. Oil pan capacity 5 quarts.
Cooling System:	Thermo-syphon, pump accelerated—capacity 22 quarts.
Fuel System:	Tank capacity 14 gallons. Hydrostatic fuel gauge. Automatic air vane type downdraft carburetion. Diaphragm type fuel pump.
Rear Axle:	¾ floating type with torque tube drive. Straddle mounted drive pinion gear.
Tires:	5.50 x 17—pressure 35 pounds.
Wheelbase:	112 inches.
Turning Circle:	40 feet.
Tread:	56 inches.
Road Clearance:	9 inches.
Engine Number:	The engine number is also the serial number of the car. The number is stamped on top of the clutch housing, also on the frame side member in front of left dash bracket.

The Owner's Responsibilities

The car has been designed and built so that it will furnish a safe, comfortable, carefree and economical means of transportation for many thousands of miles. However, no amount of engineering ingenuity or care in the manufacture can take the place of reasonable care and an avoidance of malpractices by the driver.

A new machine requires more careful attention during the first few days it is being driven than after the parts have been thoroughly "worked in." To obtain best results, a new car should not be driven faster than 35 miles per hour for the first 500 miles.

In addition to familiarizing yourself with the controls familiarity with the points requiring periodic attention to maintain their efficiency is essential. These points are completely covered on pages 14 to 23.

It is recommended that when these services are required you take the car to an authorized Ford dealer. Have your Ford dealer explain the Ford Service Certificate Plan.

The following suggestions are offered to assist you in the operation of the car:

When shifting gears, move the gear shift lever as far as it will go, this will hold wear of the gears to a minimum.

Avoid driving with your foot resting on the clutch pedal as this may cause the clutch to slip, causing premature wear of the facings and the clutch release bearing.

Have your clutch pedal adjusted when the free movement becomes less than one inch.

Depress the clutch pedal while starting the engine, particularly in cold weather. This lessens the load on the starter and decreases the draw on the battery.

Maintain a pressure of 35 pounds in the tires not only to reduce tire wear and save fuel but as a safety measure to improve braking and steering.

Do not use boots in the tires, particularly on the front wheels. They destroy their balance and are a constant menace to your safety when the car is operated at the higher speeds.

Shock absorbers contribute to your safety as well as your comfort and should be occasionally checked and the fluid replenished.

Strong door, steering and ignition locks are provided. Lock the car when parking. Keep a record of the various **key** numbers. It may save you from inconvenience should any of the keys become lost or misplaced.

Always keep sufficient oil in the oil pan of the engine. **Check the oil level every 100 miles when operating under high speeds.**

Owners operating cars under extremely dusty conditions should install a Ford oil bath type air cleaner to prevent rapid wear of the internal parts of the engine.

The finish of the body and fenders should be protected from the elements by a suitable body polish. **The twice yearly application of Lincoln polishing wax will provide excellent protection, preserving the original luster and beauty.**

During Cold Weather

The cooling system should be protected from freezing in winter by the use of a suitable anti-freeze.

Correct procedure for cold weather starting is as follows:

Unlock ignition lock.

Turn on ignition switch.

Be sure gear shift lever is in neutral position.

Pull the choke button all the way out. **(Do not pull out the throttle button** as the choke button automatically opens the throttle the correct amount for starting.)

Hold clutch pedal down with left foot, at the same time press on starter button.

As soon as the engine starts remove your foot from the starter button (allow the engine to run 30 seconds or more with clutch pedal still depressed).

Avoid racing the engine while it is cold.

Push the choke button "in" as far as possible without disturbing the smooth performance of the engine. As soon as the engine is warmed up push the choke button all the way in. **Continued operation with the choke button out causes serious dilution of the oil in the engine oil pan.**

Avoid any rapid movement of the accelerator pedal as this causes a spray of gasoline to be injected into the cylinders. In a cold engine this gasoline leaks past the pistons causing dilution of the engine oil.

In zero weather the running of the motor for approximately one minute before turning on the lights will reduce the possibility of their burning out while the generator charging rate is adjusting itself to the high resistance offered by the cold battery.

Drain water and sediment from the fuel pump as often as necessary to prevent freezing.

Engine oil diluted with either gasoline or water has little lubricating value and regardless of its mileage should be replaced with oil of the proper viscosity and quality. **Watch the oil for dilution,** particularly in cold weather, when engine is operated under sub-normal temperatures.

Instruments and Controls

The instruments and controls used in the operation of the car are shown in Fig. 1.

The Throttle Button is located on the instrument board to the left of center. Pulling the button out opens the throttle so as to maintain any desired engine speed on the road without depressing the accelerator pedal. Pushing the throttle button in closes the throttle and reduces the engine speed to idling speed as set on carburetor.

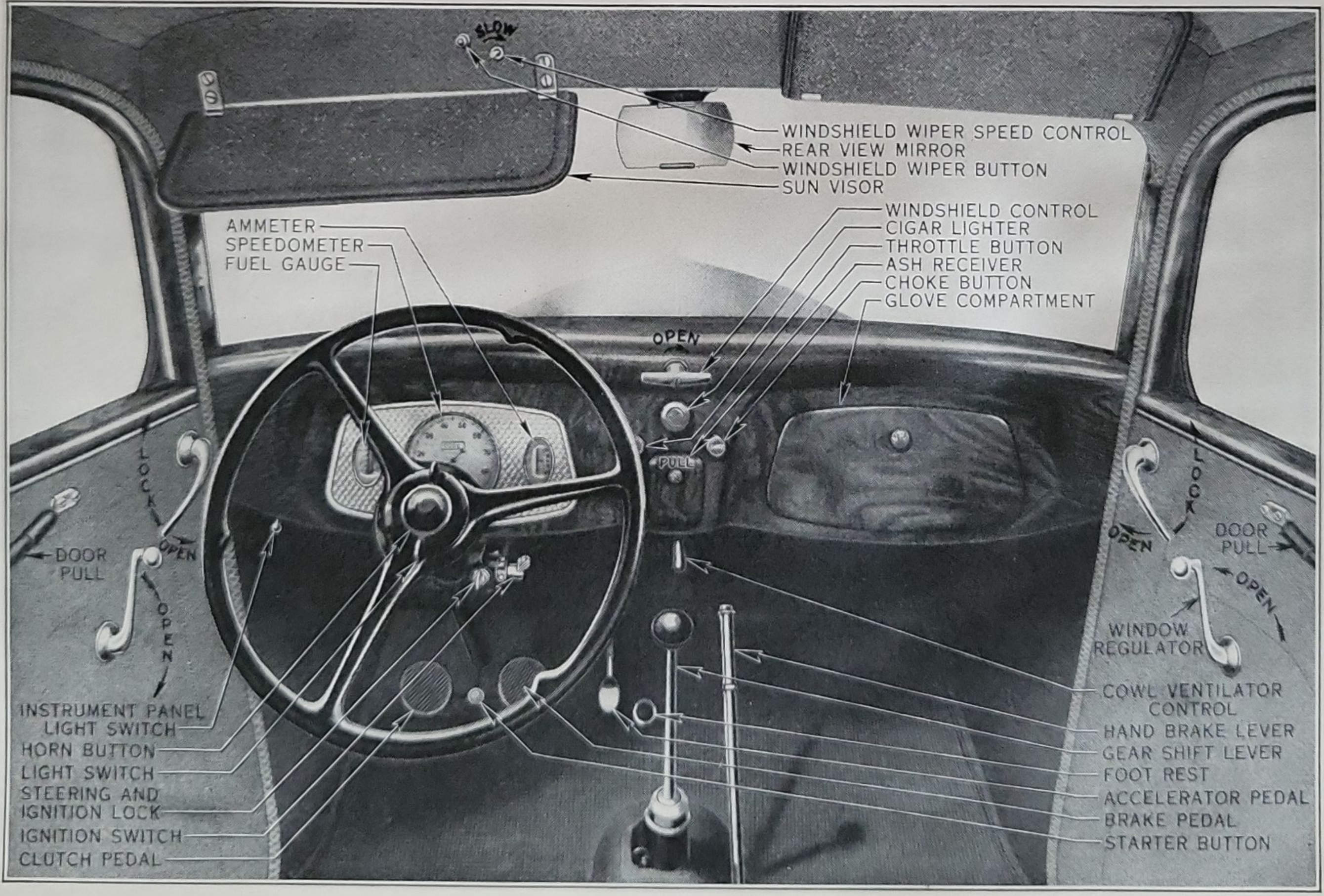
It is not necessary to use the throttle button for starting as the choke button automatically opens the throttle the correct amount for starting.

The Choke Button is located on the instrument board to the right of center. Pulling the button out closes the choke valve in the carburetor, permitting a rich gasoline mixture to be drawn into the cylinders for cold weather starting. The richness of the mixture is in direct proportion to the extent to which you pull the choke button out. **The engine should never be operated with the choke button pulled out.**

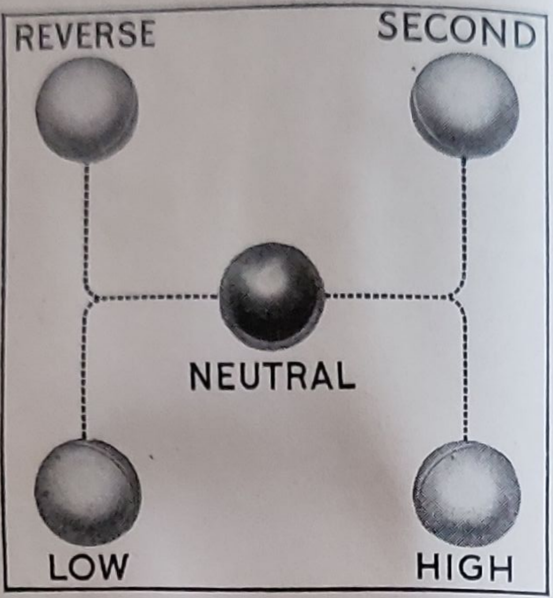
The Starter Button is located on the floor board under the steering column; pressing downward on the button closes the starter circuit and the starting motor will crank the engine. The button will return to normal position, opening the starter circuit, when released.

The Accelerator Pedal controls the amount of the fuel and air mixture entering the cylinders by opening the throttle valve in the carburetor. This pedal also operates the accelerating pump in the carburetor. Quick downward pressure on this pedal causes a spray of fuel to be injected into the carburetor throat for maximum acceleration. **Avoid depressing this pedal rapidly if the engine should stall when warm as this spray may flood the engine and make restarting difficult.**

The Ammeter, located to the right of the speedometer, indicates "C" (charge) when the generator is charging the battery. If the engine is running above 15 miles per hour and the ammeter does not register "charge" when the lights and electrical accessories are "off" consult a Ford dealer.



Instruments and Controls (Deluxe)
Figure 1



Gear Shift Lever Positions
Figure 2

The Gear Shift Lever permits the selection of the gear reduction required. The gear shift positions are arranged in the conventional manner (see Fig. 2). **The lever should always be in neutral position when starting the engine.**

The Clutch Pedal provides control of the clutch engagement. **Avoid resting your foot on this pedal when driving.**

The Brake Pedal and Hand Lever both control the brakes on all wheels. Pull the hand brake lever back when parking, particularly on inclines. When releasing the hand brake lever press downward on the foot pedal. This will remove the tension and permit the pawl to be withdrawn from the ratchet freely and assist in releasing the brakes.

The Spark Control on the Ford car is entirely automatic and requires no attention other than the original adjustment made at time of manufacture. It is so designed as to automatically advance the spark by means of a centrifugal governor in proportion to the speed of the engine and to automatically retard the spark under load in direct proportion to the load.

The Windshield Wiper Button is located just above the windshield in front of the driver's seat. When pulled back the windshield wiper is "on" and will operate when the engine is running.

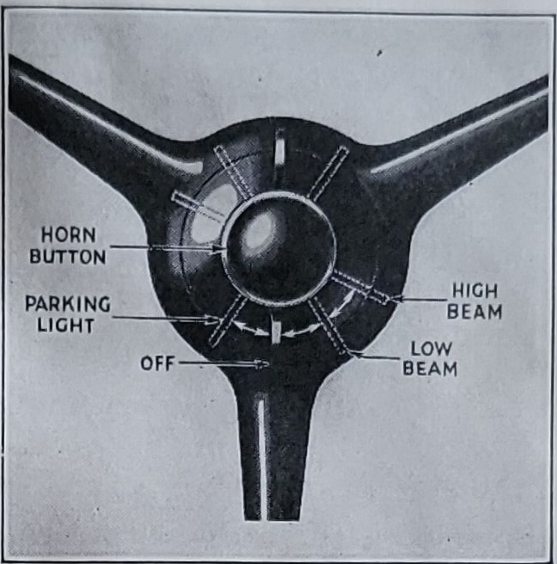
Windshield Wiper Speed Control, located to the right of the windshield wiper button, provides control of the operating speed of the wiper. Turning the windshield wiper speed control button in a clockwise direction decreases the operating speed. Turning the speed control button in an anti-clockwise direction increases the operating speed.

The Rear View Mirror is readily adjustable to suit the driver's requirements. Being held in position by a friction surface it may be adjusted to the desired angle at will.

The Speedometer, located in the center of the instrument panel, in addition to indicating the speed of the car registers the accumulated mileage, which may be used as a guide for periodic lubrication and maintenance requirements (see page 14).

The Horn Button is located on the top of the steering column in the center of the steering wheel (see Fig. 3).

The Lighting Switch is located on the top of the steering column in the center of the steering wheel. When the lower portion of the handle points straight back the lights are "off." Moving the handle to the right or left closes the various circuits (see Fig. 3). The instrument panel light and tail light circuits are also controlled by this switch.



Horn Button and Lighting Switch
Figure 3

The Instrument Panel Light Switch, mounted on the lower edge of the instrument board at the left, permits the turning "off" of the instrument panel light when the lighting switch is in any of its "on" positions.

The Fuel Gauge, located to the left of the speedometer, indicates the level of the fuel in the rear tank.

Theft Proof Lock: The Ford car is equipped with a coincidental lock built into the steering column bracket which supports the steering column at the instrument board; with one operation this coincidental lock locks both the steering gear and the ignition system (see Fig. 4).

To shut off the engine, the ignition switch on the right side of this bracket should be pushed forward to the "off" position. This motion opens the ignition circuit. The key is then turned in a clockwise direction. This operation causes the locking bolt to be pushed toward the steering column, either compressing the spring behind the lock bolt or actually engaging the slot in the steel sleeve on the steering column shaft, depending upon the position of the steering wheel. If the spring behind the locking bolt is compressed, the locking bolt automatically engages in the slot in the steel sleeve on the shaft as soon as the steering wheel is revolved.

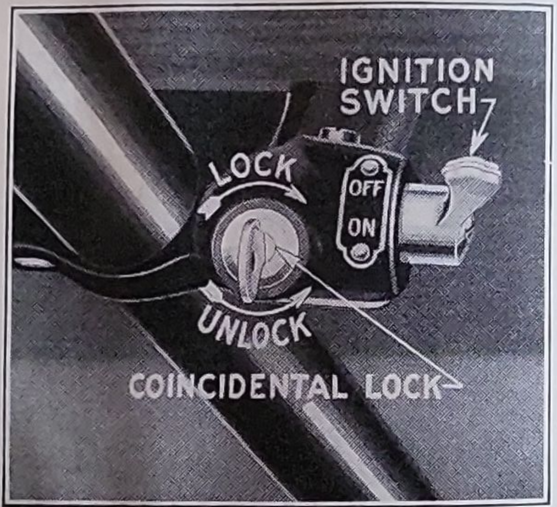
The wheel can be locked either with the front wheels straight ahead or hard over to either the right or left.

The ignition switch is locked as soon as the key is turned in the lock regardless of the position of the steering wheel and the key can be removed. Turning the key one-half turn in a counterclockwise direction withdraws the locking bolt from the steel sleeve in the steering shaft and at the same time unlocks the ignition switch.

To turn on the ignition current the ignition switch handle is pulled back to the position marked "ON."

If the key turns quite hard in the lock moving the steering wheel slightly will relieve the pressure on the locking bolt and permit the key to turn freely.

Starting the Engine



Steering and Ignition Lock
Figure 4

(1) Unlock the coincidental lock on the steering column bracket by turning the key one-half turn in a counterclockwise direction.

(2) Pull the ignition switch lever back—to position marked "on" (see Fig. 4).

(3) Be sure the gear shift lever is in neutral position (the position in which it can be moved freely from side to side).

(4) Pull the choke button out.

(5) Press on the starter button. (In cold weather the starter will crank the engine more easily if the clutch is disengaged.)

(6) As soon as the engine starts, remove your foot from the starter button.

(7) Push the choke button in.

Important

When starting a warm engine do not pull the choke button out unless the engine fails to start on the normal mixture as there is a possibility of flooding the engine with an over rich mixture of gas. If you should by accident flood the engine, pull the throttle button out **slowly** and with choke button in normal position crank the engine a few revolutions with the starter to exhaust the rich gas. Avoid moving the accelerator pedal while exhausting the rich gases, as any quick movement of the accelerator would cause the accelerating pump to inject a spray of fuel into the carburetor throat, which would increase the fuel in the already flooded engine and make restarting difficult.

Avoid racing the engine while it is cold.

Driving the Car

Before starting the car, familiarize yourself with the various instruments and controls as covered, starting on page 8.

(1) Start the engine. (See page 12 for full instructions.)

(2) Release the hand brake lever.

(3) Disengage the clutch by pushing down the clutch pedal.

(4) Move the gear shift lever to low speed position.

(5) Gradually release pressure on the clutch pedal allowing it to return to normal position. At the same time depress the accelerator pedal, increasing the engine speed (as you engage the clutch the car will move forward).

(6) When the car has reached sufficient speed, remove your foot from the accelerator, disengage the clutch.

(7) Move the gear shift lever to second speed position.

(8) Again engage the clutch, increasing the engine speed as required.

(9) When the car has reached sufficient speed, remove your foot from the accelerator, disengage the clutch.

(10) Move the gear shift lever to high speed position.

(11) Again engage the clutch.

Depress the accelerator pedal increasing the speed of the engine, and the car, to the speed desired.

(12) **To shift from high to second gear** at any speed merely disengage the clutch and make the shift with no hesitation in neutral. However, if the shift is made at high car speeds, the movement of the gear shift lever should be made quickly with no hesitation in neutral while a more deliberate movement is required for the final engagement.

(13) **To utilize the braking action of the engine** in any speed remove your foot from the accelerator pedal leaving the clutch engaged.

(14) **To stop the car** remove the foot from the accelerator and depress the clutch and brake pedals as required.

(15) **To reverse the car** (the car must be brought to a stop before attempting to reverse its direction). With the foot off of the accelerator pedal and the clutch disengaged, move the gear shift lever to the reverse position, engage the clutch and depress the accelerator pedal as required.

(16) **To stop the car in reverse** remove the foot from the accelerator and depress the clutch and brake pedals as required.

Lubrication and Maintenance

The importance of proper lubrication and periodic inspection and adjustments cannot be over-emphasized. The lubrication and maintenance work on the Ford eight-cylinder cars can be divided into two groups; first, points requiring attention every 1000 miles; second, points requiring attention twice yearly or every 5,000 miles (whichever occurs first).

The lubrication chart on pages 20 and 21 gives full information for the complete lubrication of the Ford car. Proper lubrication has a vital effect on the life of your car; consequently you should follow these instructions very carefully.

All Ford dealers are equipped to render this lubrication and maintenance service to your car.

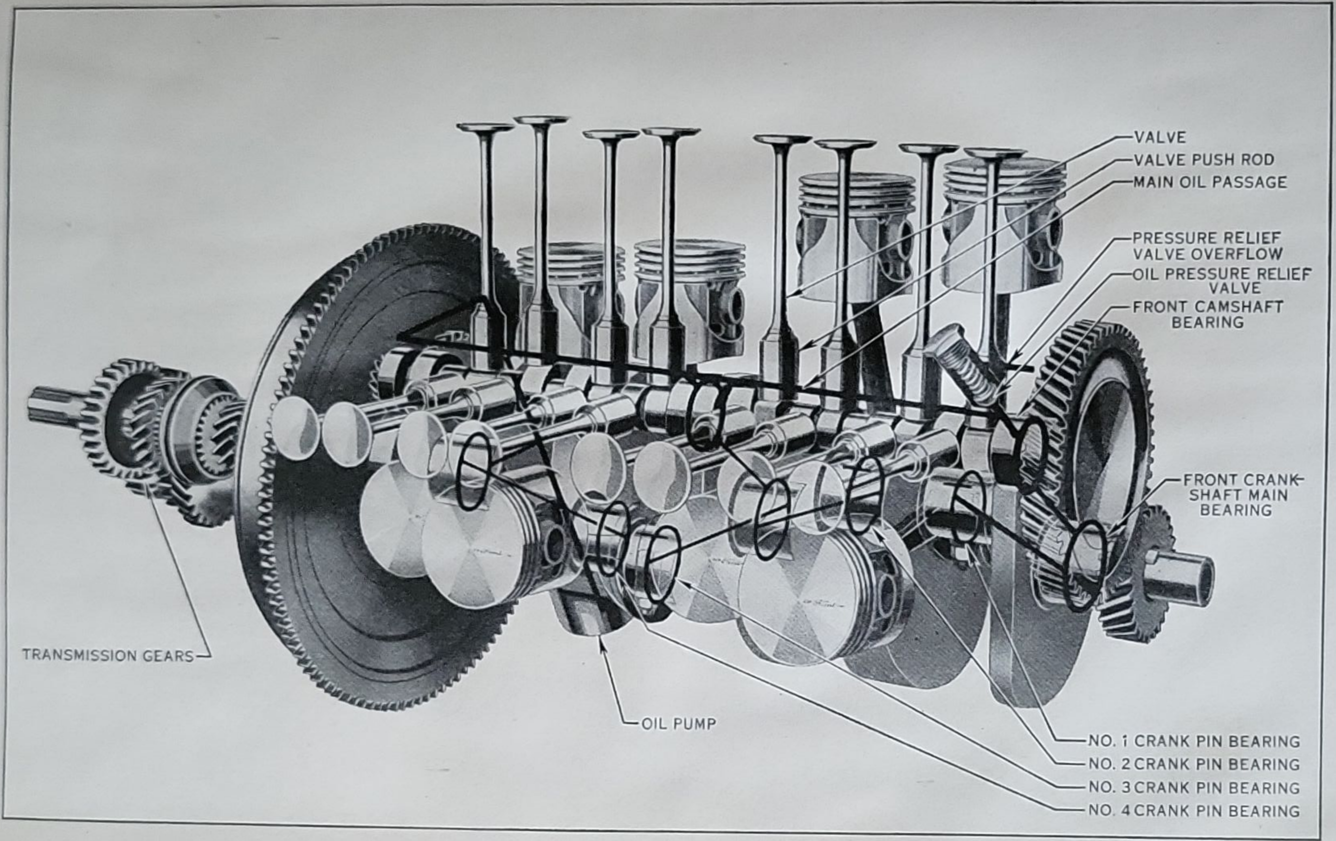
Group 1

Engine Lubrication

All parts of the engine are lubricated from the oil reservoir in the oil pan by positive displacement gear pump to all crankshaft, main and connecting rod bearings and camshaft bearings, and by splash to the balance of the motor (see Fig. 5).

It is advisable to clean out the oil pan by draining off the old oil when the new car has been driven 300 miles, and again when a total mileage of 1000 miles has been reached and at each 1000 miles thereafter. The oil will drain out more completely if warm, and should be replaced with 5 quarts of engine oil of the proper viscosity and quality.

The oil level should be checked every 100 miles, and additional oil added when required to bring it to the proper level.



Engine Oil Circulating System
Figure 5

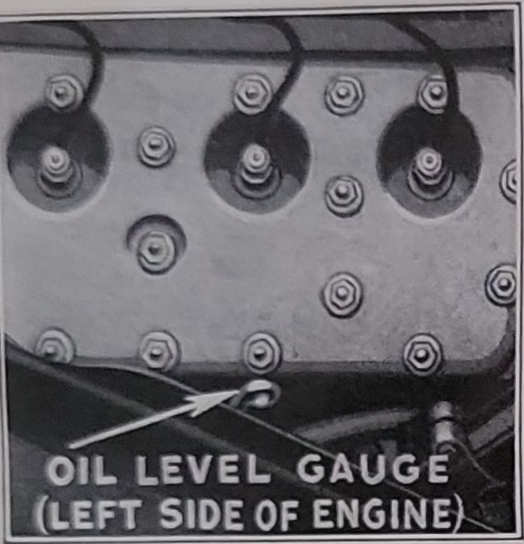


Figure 6

Since more oil is consumed by the engine at the higher engine speeds, its level must be watched closely when the engine is operated under sustained high speeds.

To determine the correct oil level, use the bayonette oil gauge located on the left side of the engine (see Fig. 6), as follows: Pull the gauge—wipe it off—re-insert and again remove it.

The mark made by the oil indicates its level. When the oil reaches the point marked "F" on the indicator, it is at the maximum level. Under no circumstances should the oil level be permitted to get below the point marked "L" as any attempt to run the engine with too little oil may seriously damage the engine.

When replacing the oil level indicator, push the indicator all the way down. Failure to fully insert it into the opening permits oil to escape.

Only high grade engine oil should be used in the engine. Oil of this kind reaches the bearing surfaces with greater ease and cuts down frictional heat. It should have sufficient body so that the pressure between the bearing surfaces will not force out the oil and allow the metal to come in actual contact. Inferior oils have a tendency to carbonize quickly, also "gum up" on the piston rings, valve stems and bearings.

In cold weather a lighter grade of oil having a low cold test is absolutely essential for the proper lubrication of the engine. Oil having the specifications of S. A. E. viscosity No. 20 should be used for temperatures below freezing. For temperatures below zero a winter oil of S. A. E. viscosity No. 10 will be satisfactory. It is essential, however, that these winter oils have a low cold test.

In general an oil having the body of S. A. E. viscosity No. 40 will prove satisfactory for summer use (temperatures above freezing). In sections where the temperatures exceed 90 degrees Fahrenheit an oil having S. A. E. viscosity No. 50 may be used.

It must be understood that these classifications are of "body" only and not of quality. It is also essential that the oil be otherwise properly refined.

Chassis Lubrication

The chassis should be lubricated as outlined below after each 1000 miles of operation. For your convenience, it is suggested that the lubrication of the chassis and the changing of engine oil be performed by a Ford dealer at the same time.

Clutch Release Bearing

The clutch release bearing is lubricated through a grease cup, located on the hand hole cover of the clutch housing. After every 1000 miles of operation, the cup should be screwed in as far as it will go. This will force the lubricant into the bearing. The cup should then be backed off and repacked with a good grade of pressure gun lubricant and replaced, screwing it in 2½ to 3 turns. Note: the clutch is a dry disc clutch and under no circumstances should it be oiled.

Steering Gear

Every 1000 miles, remove the plug on the steering gear housing and add gear lubricant until it reaches the level of the filler plug hole. Use gear lubricant only, **never use greases in the steering gear.** A gear lubricant of S. A. E. viscosity No. 160 will be suitable for summer. Use S. A. E. viscosity No. 110 for winter.

Distributor

Fill the oil cup at the front of the distributor every 1000 miles with engine oil.

Transmission

Each 1000 miles, sufficient gear lubricant should be added to bring it level with the filler plug hole. (See page 22 for further instructions.)

Rear Axle

Each 1000 miles, sufficient gear lubricant should be added to bring it level with filler plug hole. (See page 22 for further instructions.)

Generator

The bearings in the generator are lubricated through a small oil hole, located at both ends of the generator. Fill with engine oil every 1000 miles.

Universal Joint

Each 1000 miles, the universal joint housing should be filled with a universal joint lubricant composed of cylinder oil, thickened with sodium tallow soap. The universal joint housing cap is provided with a pressure gun lubricator fitting (pressure gun grease is not satisfactory for universal joints).

Pressure Gun Fittings

In order to properly force lubricant to all parts equipped with the conical shaped lubricator fittings, a high pressure compressor gun is employed. With this gun, the lubricant can be forced in under a pressure of 2000 pounds or more per square inch, thus assuring a more thorough and positive lubrication than can be accomplished any other way.

Ford dealers are equipped to render this service. However, a compressor gun is supplied with the tool equipment of each car, in case you cannot get to a Ford dealer.

To fill the compressor, remove the cap and plunger. Use a good grade of pressure gun lubricant for all bearings having the conical shaped lubricator fittings (except the universal joint), packing it solidly, avoiding air pockets. Fill only to the top of the lettering on the outside of the barrel.

When the compressor is pressed against the conical shaped fittings, the plunger moves forward, forcing the lubricant in the nozzle directly through the fitting into the bearing, under an extremely high pressure.

When the pressure on the handle is released, grasp the barrel of the compressor with one hand and draw back the handle with the other, so as to load the compressor and make it ready to deliver a charge of lubricant with the next forward thrust.

Springs

The springs should be sprayed with a penetrating oil.

Fuel Pump

Drain sediment from fuel pump by means of drain plug (see Fig. 12). In case of excessive water or sediment, drain accumulation from rear tank also.

Cylinder Head Nuts

After the first 300 miles of operation, the cylinder head nuts should be tightened. After this tightening, they will require no further attention unless head is removed.

Tires

Air pressure in tires should be checked and sufficient air be added to bring the pressure up to 35 pounds. Unequal tire pressure results in uneven braking action.

Radiator

Water and anti-freeze solution in the cooling system should be checked and replenished if required

Lights

It is advisable at this time to inspect the various lights on the car and replace any bulbs necessary.

Battery

Each 1000 miles, or every two weeks (whichever occurs first), inspect the battery and add sufficient distilled water to bring the electrolyte to the proper level. A rapid loss of water in the battery usually is an indication of an excessive charging rate, which should be corrected. (See page 50 for complete instructions.)

Starting Motor

The bearings in the starting motor are lubricated when they are installed in the car and require no further attention.

Brake Linkage

Apply a few drops of oil to all clevis pins in the brake system.

300 MILES, 1000 MILES AND EACH 1000 MILES THEREAFTER

Ⓐ PRESSURE GUN LUBRICANT

Ⓑ ONE GREASE CUP FULL PRESSURE GUN LUBRICANT

Ⓒ ENGINE OIL (DISTRIBUTOR SHAFT, SPRING TIE BOLT, GENERATOR, DOOR HINGES, BRAKE CLEVIS PINS, FAN AND ACCELERATOR)

Ⓔ ADD GEAR LUBRICANT TO LEVEL OF FILLER PLUG S.A.E. VISCOSITY No. 110 WINTER S.A.E. VISCOSITY No. 160 SUMMER

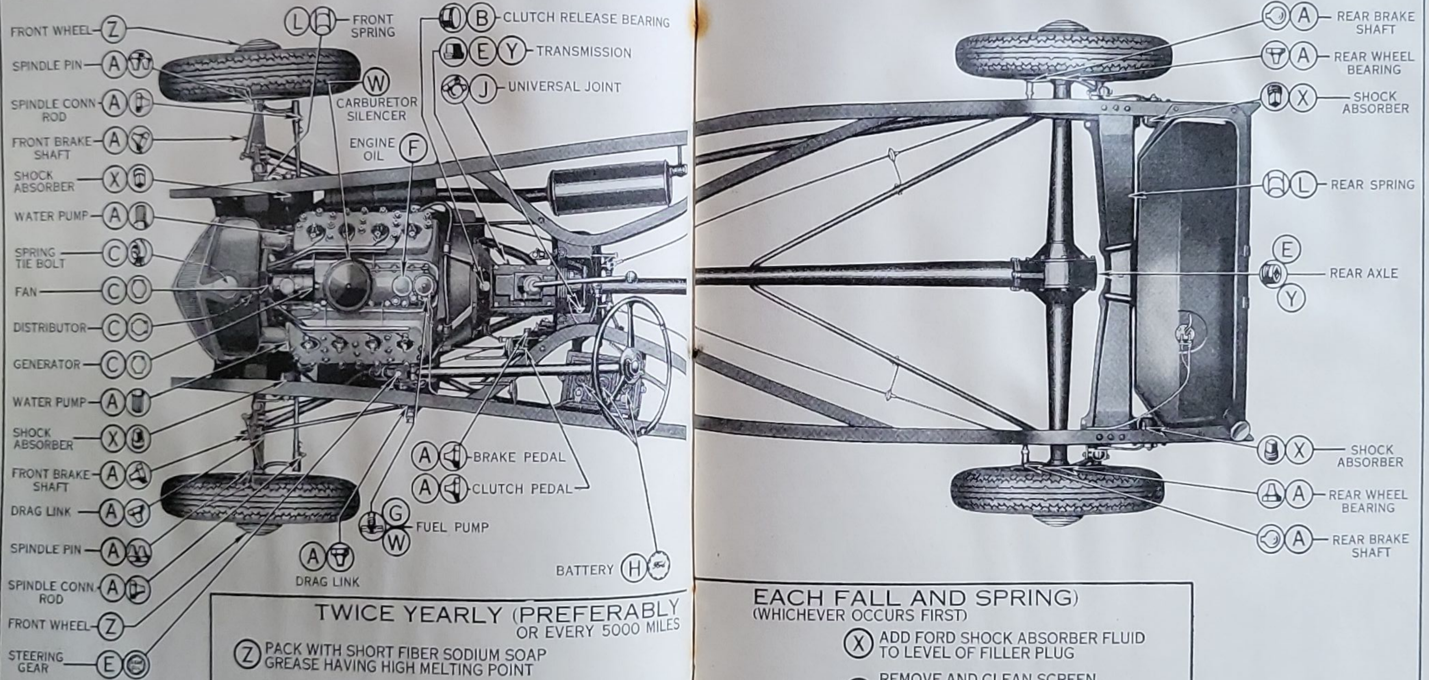
Ⓕ DRAIN AND REFILL WITH GOOD QUALITY ENGINE OIL USE S.A.E. VISCOSITY No. 20 WHEN BELOW FREEZING TEMPERATURES PREVAIL (WINTER OIL MUST HAVE LOW COLD TEST) USE S.A.E. VISCOSITY No. 40 FOR TEMPERATURES ABOVE FREEZING CHECK LEVEL EACH 100 MILES REPLENISH AS REQUIRED

Ⓖ DRAIN SEDIMENT

Ⓗ ADD DISTILLED WATER

Ⓙ UNIVERSAL JOINT GREASE (CYLINDER OIL SODA SOAP GREASE)

Ⓛ SPRAY SPRINGS (PENETRATING OIL)



TWICE YEARLY (PREFERABLY EACH FALL AND SPRING) (WHICHEVER OCCURS FIRST) OR EVERY 5000 MILES

Ⓩ PACK WITH SHORT FIBER SODIUM SOAP GREASE HAVING HIGH MELTING POINT

Ⓨ DRAIN, FLUSH, AND REFILL WITH GEAR LUBRICANT USE S.A.E. VISCOSITY No. 110 (LOW COLD TEST) IN WINTER USE S.A.E. VISCOSITY No 160 IN SUMMER

Ⓧ ADD FORD SHOCK ABSORBER FLUID TO LEVEL OF FILLER PLUG

Ⓦ REMOVE AND CLEAN SCREEN (CARBURETOR SILENCER SCREEN MAY BE DIPPED IN LIGHT OIL)

Lubrication and Maintenance Chart

Figure 7

Lubrication and Maintenance

Group II

Twice each year, preferably in the fall and spring, or every 5,000 miles (whichever occurs first), in addition to all the lubrication and maintenance operations in Group I, the following operations are required:

Rear Axle

Each fall and spring the lubricant in the rear axle should be drained and the housing flushed with kerosene. New lubricant should then be added until it reaches the level of the oil filler hole in the housing. Use the correct grade of lubricant to suit climatic conditions (see chart, pages 20 and 21).

Transmission

Each fall and spring the gear lubricant should be drained from the transmission by removing the drain plug at bottom of transmission case. The interior of the transmission case should then be thoroughly flushed with kerosene and refilled with fresh gear lubricant of the correct grade (see chart pages 20 and 21).

The new lubricant is poured into the transmission through the filler hole, located at the right hand side of the transmission case. Pour sufficient lubricant in until it reaches the level of the filler hole.

Front Wheels

Twice yearly or every 5,000 miles (whichever occurs first), or at any time when the car has been operated with the front wheel inner hub cap missing, the front hubs should be removed and the bearings and the inside of the hub washed clean with kerosene and repacked with a short fibre sodium soap grease having a melting point of not less than 350° F. Complete instructions for removing the hubs are given on page 42.

Shock Absorbers

Each fall and spring or every 5,000 miles (whichever occurs first), the level of the fluid in shock absorbers should be checked and sufficient fluid added until it reaches the level of the filler plug. The correct fluid may be secured from any authorized Ford dealer. **Grease or engine oil should never be added to the shock absorber.** Consult your Ford dealer.

Ignition

Periodically inspect the gaps between the breaker points as well as the spark plug gaps and adjust as required.

Battery

Keep battery connections clean and tight.

Body Bolts

Inspect body bolts. If loose, they should be tightened.

Clutch

Watch the amount of free travel of the clutch pedal and keep adjusted according to instructions given on page 36.

Brakes

Check the movement of the brake pedal, readjusting the brakes if the pedal travels to within two inches of the floor board when the brakes are applied (see page 47).

Carburetor Silencer

Twice yearly or every 5,000 miles (whichever occurs first), the screen should be removed from the carburetor silencer and washed in gasoline. After the gasoline has dried, dip the screen in engine oil and reinstall.

Where the car is operated under dusty conditions, it may be necessary to clean the silencer oftener. Operating the car with an excessively dirty silencer will cause high fuel consumption.

Cars operated under extremely dusty conditions should have the Ford oil bath type air cleaner. Consult your Ford dealer.

Fuel Pump

Clean the fuel pump screen and drain out sediment.

Body

A twice yearly application of Lincoln polishing wax will enhance and preserve the luster and beauty of the body and fenders.

The Engine

In the designing and building of the Ford eight-cylinder engine, those features have been retained which were present on previous Ford engines that accounted for their efficiency, long life and world wide acceptance.

Figures 8 and 9 are sectional views of the engine. The engine is of the 90 degree block with 90 degree crankshaft design. The eight cylinders and crankcase are cast en bloc, assuring the permanence of the relative locations of the reciprocating parts.

The camshaft is driven by a helical cut gear on the crankshaft, thus eliminating the need of a timing chain or idle gears and the consequent adjustments.

The circuit breaker and distributor is driven by the camshaft, eliminating the necessity for shafts, gears, etc., and adjustments to compensate for wear.

Should the performance of the engine at any time become sluggish or noisy, consult any authorized Ford dealer. You will find them highly efficient and with an earnest desire to serve you, and the possiblity of trouble on the road will be remote.

Trouble on the Road

We have anticipated as far as possible the various combinations of circumstances which would result in difficulty with the engine being experienced by Ford owners and have incorporated in the design such features as to combat them. However, should trouble at any time be experienced, consult an authorized Ford dealer. If a dealer is not readily available, a process of elimination will isolate the cause and the remedy will suggest itself.

To Operate the Engine Requires:

A fuel system which provides a mixture of gasoline and air for the engine.

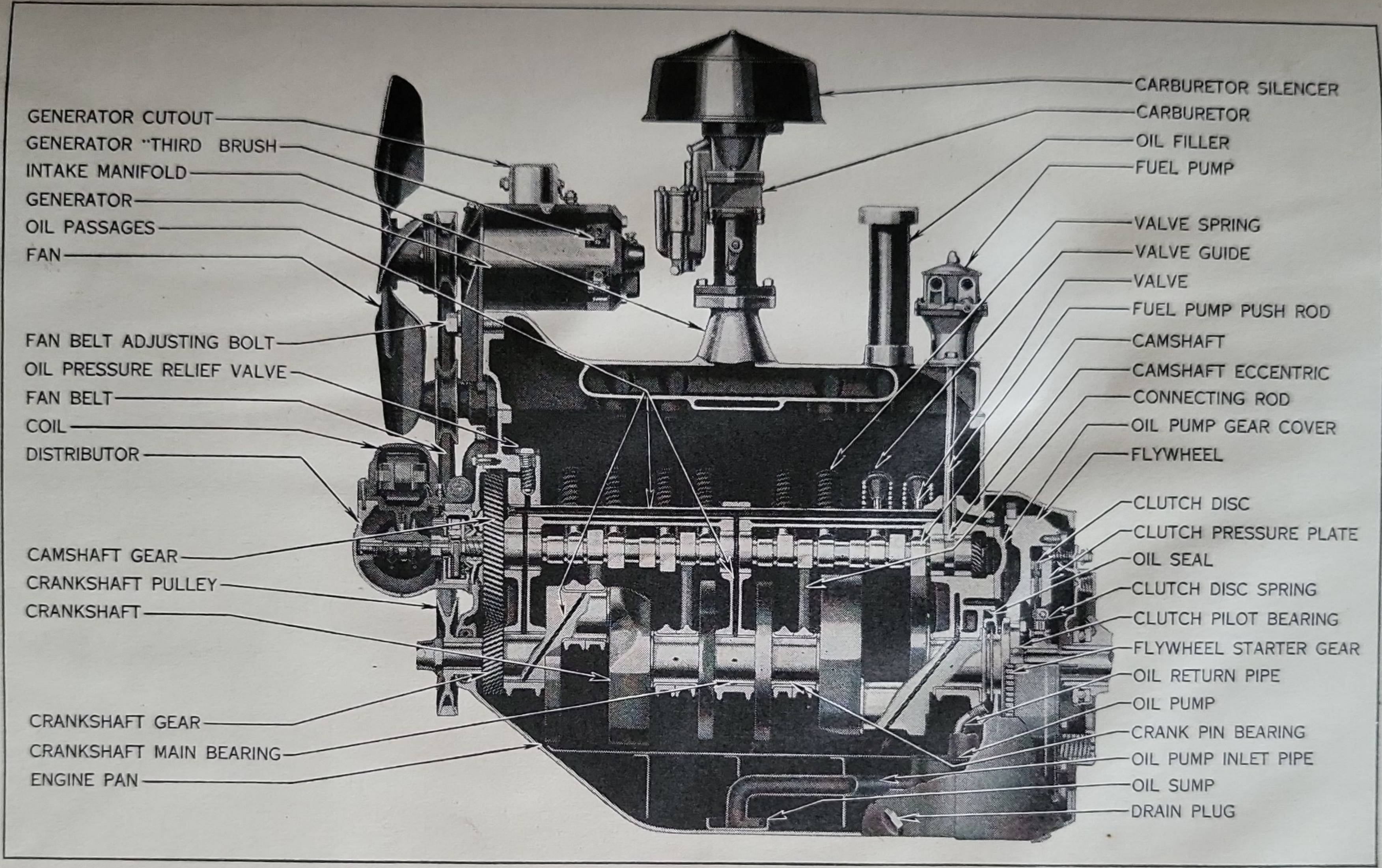
An ignition system to provide a spark at the spark plug points to ignite the fuel-air mixture.

The proper compression of the fuel-air mixture in the cylinders before ignition.

A cooling system to prevent overheating.

An oiling system to reduce frictional heat and prevent seizure of the working parts.

Each of these systems are explained in detail elsewhere in this book.



Longitudinal Sectional View of Engine
Figure 8

To Isolate the Cause of the Trouble, proceed as follows:

Fuel

Disconnect the fuel pump to carburetor line at the carburetor. If the cranking of the engine, either by hand or the starting motor, does not cause gasoline to flow from this line, sufficient fuel is not being supplied to the carburetor.

Should this test indicate that the carburetor is not receiving sufficient fuel, the fuel pump screen (see Fig. 12) should be examined and cleaned. If the cleaning of this screen does not correct the trouble, the fuel pump and fuel line should be examined further (see page 33).

Ignition

A spark should be produced at each spark plug once for every two revolutions of the engine, whether cranked by hand or the starting motor. To test, touch a wooden handled screwdriver to the cylinder head and the spark plug nut while engine is cranked. If a spark is not noted, the ignition system is at fault (see page 56).

If a spark is noted only when the screwdriver touches the plug the spark plug gap is probably too small or the plug is shorted and should be replaced if the trouble cannot be corrected by cleaning and adjusting the gap to .025 inch.

If a spark occurs when the screwdriver is held $\frac{1}{16}$ inch or more away from the spark plug nut, the spark plug gap is probably too wide or the plug has a high resistance and should be replaced.

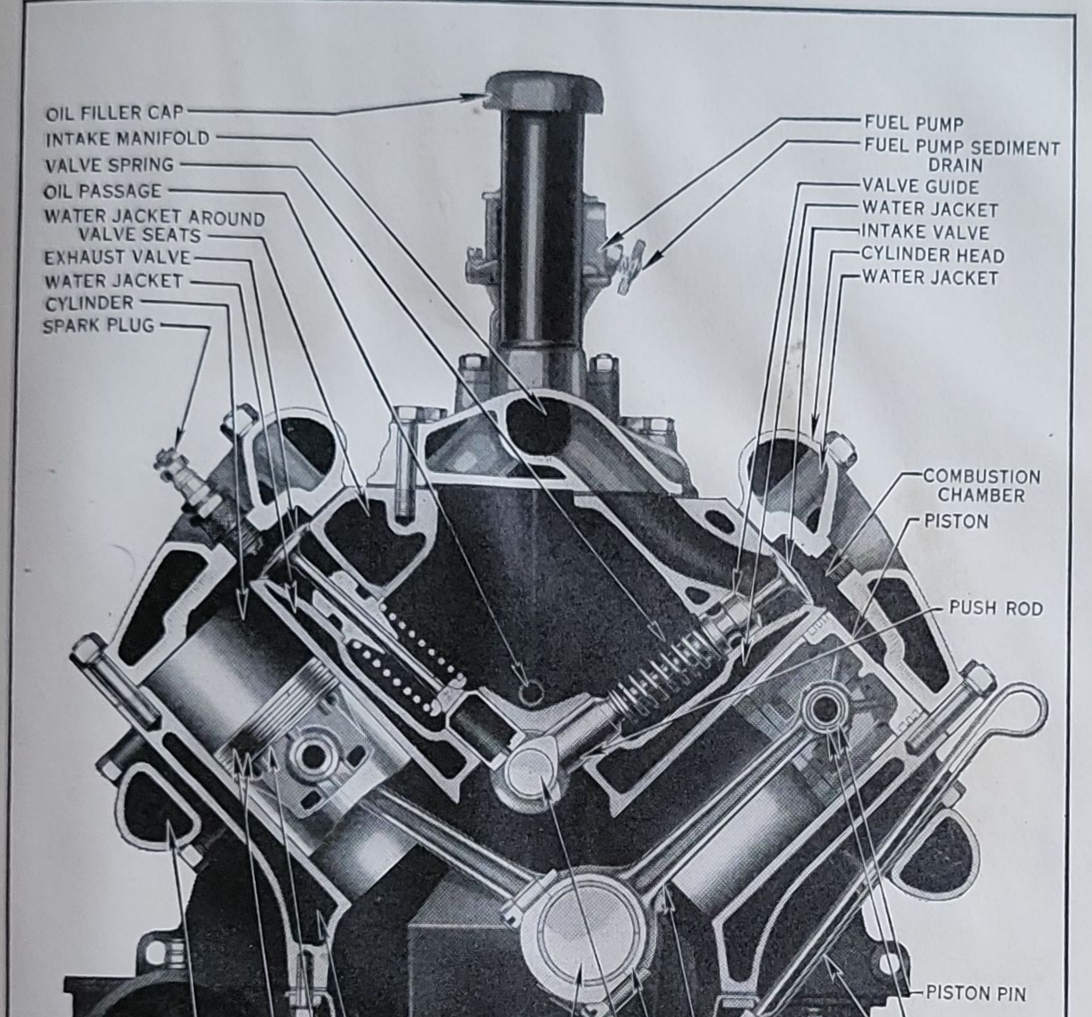
Compression

The compression of the engine can be tested by cranking the engine by hand. Crank the engine slowly noting any difference in degree of compression of each cylinder as compared with the other cylinders. Any notable difference in compression affects the operation of the engine and should be corrected.

To determine which cylinder is low on compression first acquaint yourself with the firing order of the engine.

The firing order of the V-8 engine is 1-5-4-8-6-3-7-2. The cylinders in the right bank are numbered 1-2-3-4 with number one cylinder to the front. The cylinders in the left bank are numbered 5-6-7-8 with number 5 cylinder to the front. (Right or left is as viewed from driver's seat.)

The compression strokes may be separated by testing 4 cylinders at a time. This can be accomplished by removing spark plugs 5-8-3-2 while testing the compression of 1-4-6-7, then reinstall the 4 spark plugs and remove spark plugs 1-4-6-7 while testing cylinders 5-8-3-2.



Cross Sectional View of Engine
Figure 9

Remove number one spark plug and blocking the spark plug opening with the thumb, crank the engine until pressure is felt in number one cylinder. Then watching through the spark plug opening continue to crank until number one piston is at the top of its travel. The next cylinder, the compression of which is felt at the crank, is the next cylinder in the firing order outlined above. Be sure to reinstall number one spark plug and count the cylinders as the compression of each is felt.

To distinguish between loss of compression by the rings from loss of compression by the valves, after the cylinder or cylinders which are low on compression are found, cover the top of the piston under test with oil to seal the rings and retest the compression of the cylinder. If the compression is still low the valves are at fault and probably need regrinding.

If the compression has been restored by the application of oil to the top of the piston, the trouble is with the piston rings which should be replaced.

A loss of compression only noted when engine is warm may indicate incorrect valve clearance between the valve stem and the push rod.

Valves

The valve clearance is accurately set beyond the maximum expansion of the valve, with the engine **cold** without the use of adjusting screws, etc. The specially developed Ford steels used in the valves make them able to withstand the high temperatures of sustained high speed without damage except where the ignition is late. Have the circuit breaker point gaps checked periodically and adjusted to compensate for wear of the breaker arm.

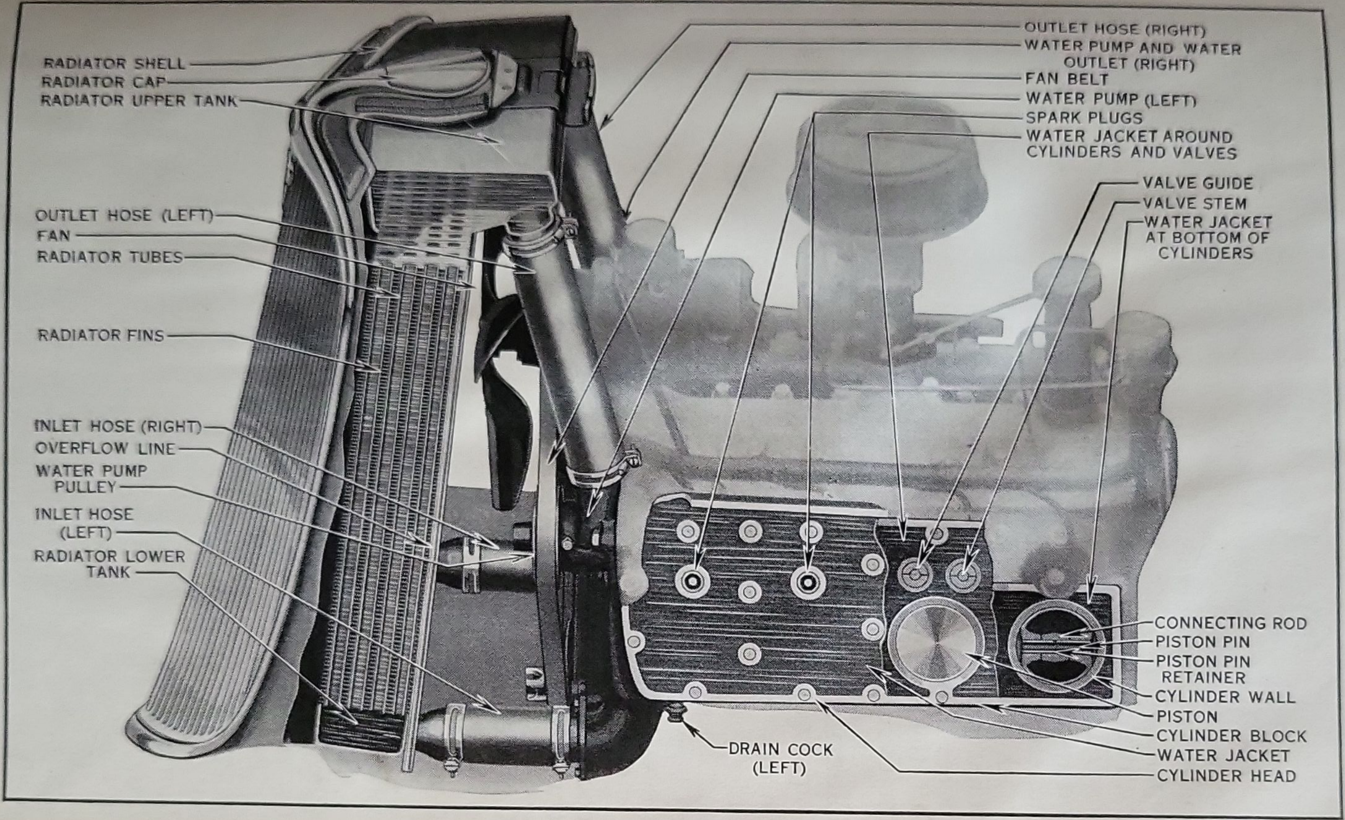
The correct clearance for all V-8 valves is from .0125 to .0135 inch.

When valves require attention take the car to an authorized Ford dealer. All Ford dealers are equipped to duplicate the accurate work of the factory.

Permitting the engine to idle long enough for the valves to cool before turning the ignition "off" will materially lengthen the life of the valve when the car is operated under sustained high speeds.

Cooling and Lubrication

If the engine overheats, check the oil level in the engine and the water level in the radiator and replenish each as required. However, if the water is extremely low, **allow the engine to cool off before adding water, the sudden contraction of the cylinders, by the cold water, may crack them.**



Cooling System
Figure 10

The Cooling System

The Ford engine is cooled by a circulation of water through the water jackets which surround the cylinders, combustion chambers, and valve seats. The water is circulated by thermo-syphon action, the flow of water being accelerated by means of centrifugal water pumps located at the front of each cylinder head. These pumps draw the heated water from the engine into the upper radiator tank, from which it flows downward through numerous tubes to the lower radiator tank and back to the water jackets of the engine. An arrangement of fins around the radiator tubes effectively carry off the heat of the water as it passes through them. The heat is then radiated from these fins into the current of air drawn in by a fan located to the rear of the radiator.

Cleaning the Cooling System

The entire system should occasionally be flushed out. To do this, open the drain plugs (on the side of each bank of cylinders, at the front, to the rear of the water inlet connection) and insert a hose into the radiator filler neck, allowing the water to flow through the system for about fifteen minutes or until the water comes out clear.

Never use caustic alkali radiator cleaners in the V-8 cooling system as they have a very injurious effect on the aluminum cylinder heads.

Care of the Cooling System in Winter

In freezing weather it is necessary to use a suitable anti-freeze solution in the system to prevent freezing of the water.

Alcohol, Radiator Glycerine or Ethylene Glycol solutions are satisfactory to use as an anti-freeze.

Salt solutions such as calcium or magnesium chloride, sodium salicylate, etc., honey, glucose and sugar solutions, and oils are not satisfactory for use in the cooling system.

Before adding anti-freeze solution to the cooling system it is important that the entire system be thoroughly flushed as outlined above. Cylinder head gaskets must be in good condition and kept tight at all times to prevent the solution leaking into the crankcase where it may cause gumming and sticking of the working parts of the engine.

Evaporation or mechanical loss may weaken your anti-freeze solution, consequently they should be tested frequently, especially in severe weather.

Either Ethylene Glycol or Radiator Glycerine used as an anti-freeze must contain effective inhibitors designed to control corrosion.

Lacquers are softened by alcohol and it is therefore extremely important that every precaution be taken to avoid spilling alcohol on any of the painted surfaces of the car. If this should accidentally occur the surface should be immediately flushed with a large quantity of water.

Suitable anti-freeze solutions can be obtained from any authorized Ford dealer, also complete directions as to the percentage of solution to be used to withstand the various low temperatures.

Adjusting the Fan Belt

The fan, water pumps, and generator are operated by the same "V" shaped belt. The adjustment is made by loosening the generator support clamp bolt (see Fig. 8) and moving the generator upward. The proper adjustment is so that there is ¾″ to 1″ movement of the belt at a point halfway between water pump and crankshaft pulley. Permit a Ford dealer to check the adjustment as soon as possible.

Fuel System

The gasoline is carried in a 14 gallon tank mounted on the frame at the rear of the car. From this tank the gasoline is drawn to the fuel pump. From which the gasoline is pumped to the carburetor where it is mixed with air and drawn into the cylinders by piston suction.

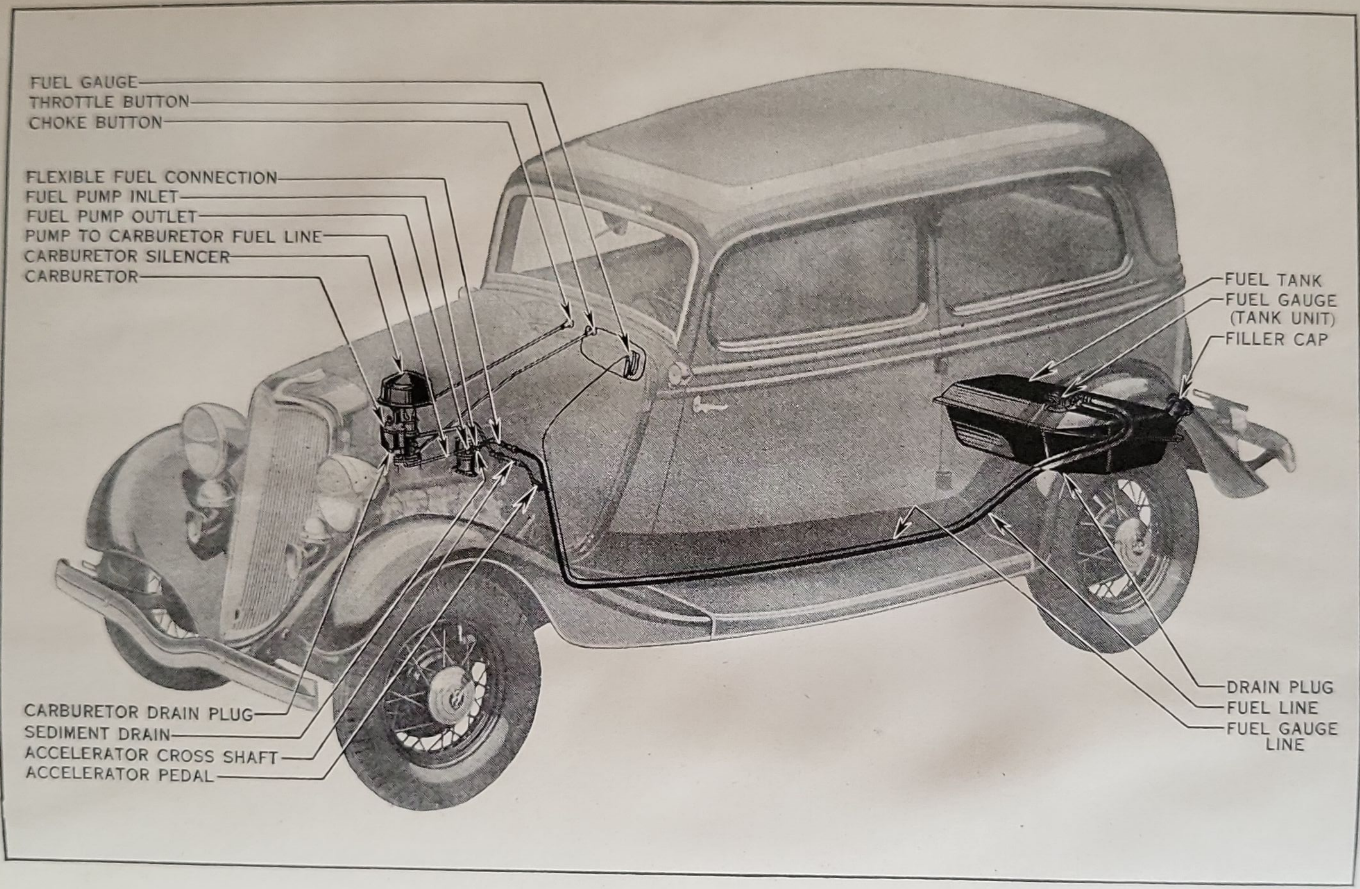
The level of the gasoline in the tank is indicated by the gauge on the instrument panel.

Gasoline Tank

The gasoline may be drained by removing the plug at the bottom of the tank. The tank is provided with a trap to catch water or sediment which should occasionally be run off through this hole.

Gasoline Gauge

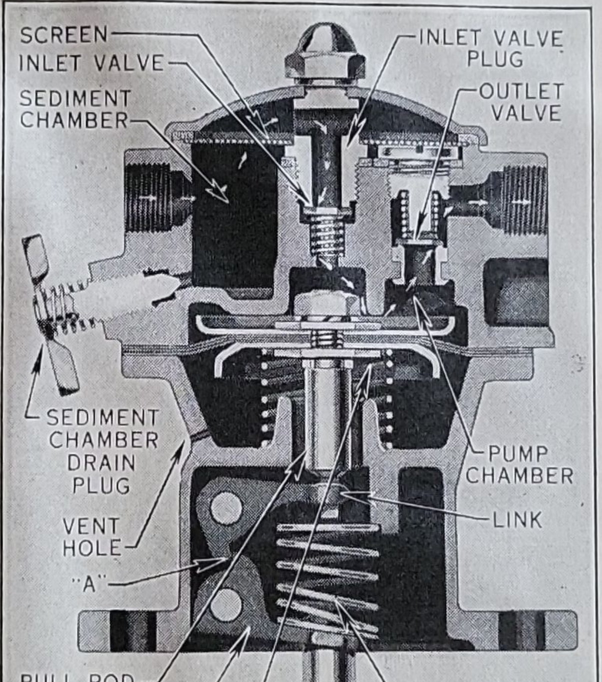
The hydrostatic fuel gauge mounted on the instrument panel indicates the amount of fuel in the tank at the rear of the car and is operated by pressure of the gasoline on air trapped in an air bell submerged in the tank. Being self-correcting and entirely automatic in action, it requires no attention other than the keeping of the fuel gauge line connections tight and the line free from obstructions.



Fuel System
Figure 11

If at any time the level of the fluid in the gauge fluctuates with acceleration or sudden stops it is no doubt caused by the presence of water in the line, caused by condensation, in which case consult an authorized Ford dealer.

If at any time for any reason it is necessary through loss to replace the fluid in the gauge it should be secured from an authorized Ford dealer, as the accuracy of the gauge is dependent on the specific gravity of the fluid used.



Fuel Pump
Figure 12

Fuel Pump

The fuel pump is located on the top of the engine behind the carburetor and is driven by an eccentric on the camshaft (see Fig. 12). It draws the gasoline from the tank and supplies it to the carburetor. Being automatic in action, the pump requires little attention other than to keep it free from dirt and keep all connections tight.

The construction of the pump is such as to provide a trap for sediment or water which can be drained off by means of the drain plug on the side of the pump.

Trouble

If at any time the carburetor is not receiving sufficient gasoline one of the following is likely to be the cause:

(1) Fuel tank is empty.

(2) Fuel pump screen has become fouled with sediment, in which case it should be cleaned.

(3) The gasoline line or its connections have a leak at some point, permitting the entrance of air to the line. The remedy, of course, being to stop the leak, at which time the pump will prime itself and again function properly. Cranking the engine for 20 seconds with the starter should prime the pump.

An air leak is sometimes caused by the sediment chamber drain plug not being properly seated. Tighten drain plug to correct.

(4) If at any time gasoline is seeping through the small vent hole shown in lower half of fuel pump (see Fig. 12) it is an indication of the diaphragm in the pump having become worn. While this does not usually render the pump inoperative immediately, it is advisable to replace the diaphragm. Ford dealers carry these parts in stock and it is recommended that you consult them should repairs be required.

Carburetor

The carburetor is of the down draft type with accelerating pump, sleeve valve choke, and air vane operated main fuel supply jet. The carburetor is entirely automatic in action. All adjustments are made at time of manufacture and with the exception of the idling adjustment will remain permanently correct unless tampered with. The idle adjustment should be readjusted after the breaking in period. Your Ford dealer will make this adjustment when you return the car for inspection after the first 300 miles of operation.

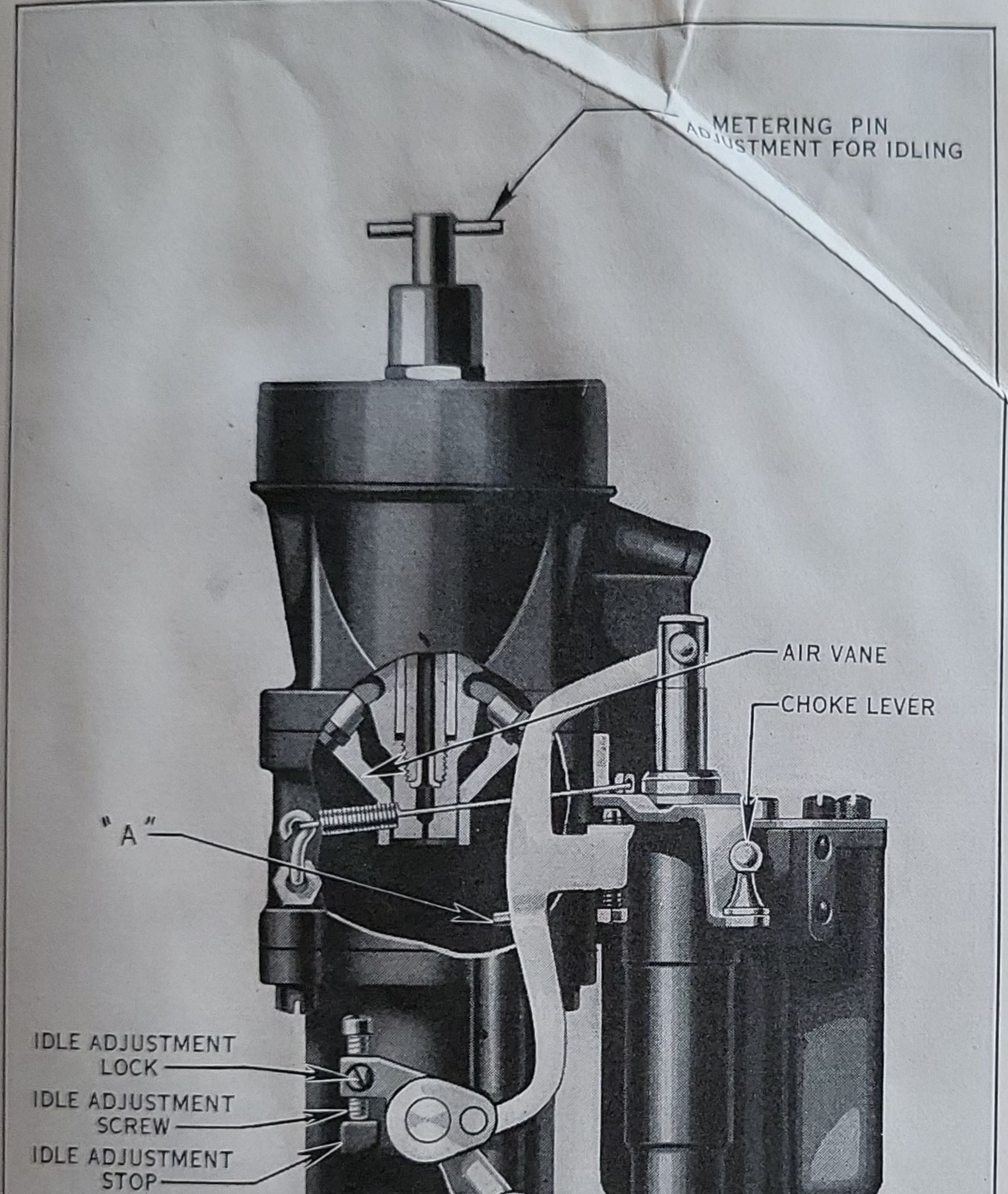
Adjustment

The idle speed of the engine should be set by means of the throttle plate adjusting screw (see Fig. 13) to a speed equivalent to five miles per hour.

When the metering pin is correctly adjusted at idle speed the carburetor is set for maximum engine performance and usually no other adjustments are required.

Metering Pin Adjustment

Normally, only one adjustment of the V-8 carburetor is required, this adjusting being the fuel adjustment for idling. The metering pin is raised or lowered by screwing it into or out of the fuel orifice. **Be súre the engine is well warmed up,** and there are **no air leaks** at manifold (tighten screws) or windshield wiper or distributor vacuum line (tighten connections), then remove the carburetor silencer, adjust the metering pin carefully **at idle speed.**



Carburetor
Figure 13

Screw the adjustment down until the performance of the engine indicates that the mixture is too lean (speed of engine will decrease), then turn it back slowly, (allowing 30 seconds at each setting to note the performance of the engine) until the engine performance is again smooth (speed will increase slightly).

Silencer

Too rich a fuel-air mixture, as indicated by sluggish performance and black exhaust gases, may indicate a clogged screen in the carburetor silencer. If the car is operated under dusty conditions, it will be necessary to clean this silencer screen frequently.

Cars operated under extremely dusty conditions should have the Ford oil bath type air cleaner (consult your Ford dealer).

The Clutch

The clutch on the Ford V-8 car is of single plate, cushion type dry disc with mechanical damper operated by the foot pedal. The clutch is the medium through which the power of the engine is delivered to or cut off from the transmission.

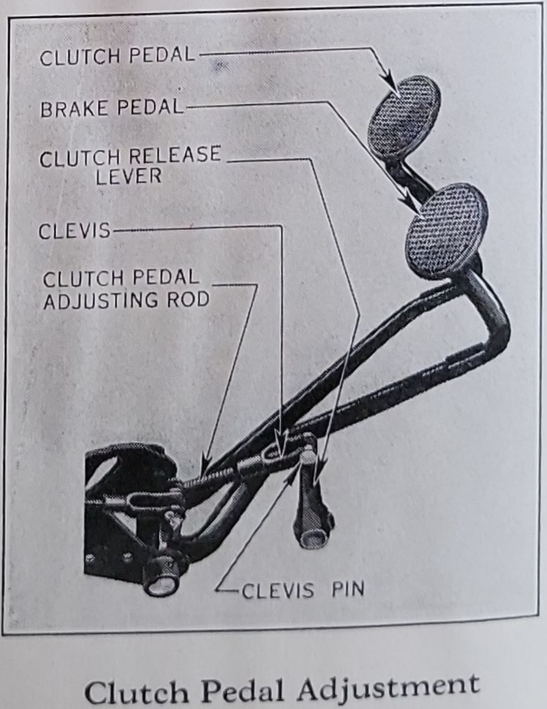
When driving power is applied a certain amount of restrained movement exists between the clutch disc hub and the clutch disc proper, caused by the flexing of the clutch disc springs (Fig. 15). The clutch disc by virtue of this mechanical construction smooths out and stabilizes the flow of power through the entire range of acceleration and deceleration.

Releasing of the clutch when starting the motor will decrease the draw on the battery and assist starting, particularly in cold weather.

Fig. 15 illustrates the arrangement of the component parts of the clutch and transmission.

Adjustment

The clearance between the clutch release bearing and the clutch plate release



Clutch Pedal Adjustment
Figure 14

fingers must be maintained at all times and is indicated by the amount of free travel of the clutch pedal. As the clutch disc facings become worn, it will be necessary to adjust this clearance. The correct adjustment is when the clutch pedal has from one and one-quarter to one inch free movement. This adjustment is easily made by removing the clevis pin (see Fig. 14) and turning the clevis on the release arm rod. Screwing the rod out decreases the clutch pedal free movement. Screwing the rod in increases the amount of free movement. After making the adjustment, be sure to replace the clevis pin and cotter key. It is recommended that an authorized Ford dealer make this adjustment should it in time be required.

Abuse

Driving with your foot resting on the clutch pedal, commonly referred to as "riding the pedal," will result in premature wear of the release bearing and clutch disc facings, and necessitate frequent adjustment and may in time necessitate reconditioning of the clutch.

Transmission

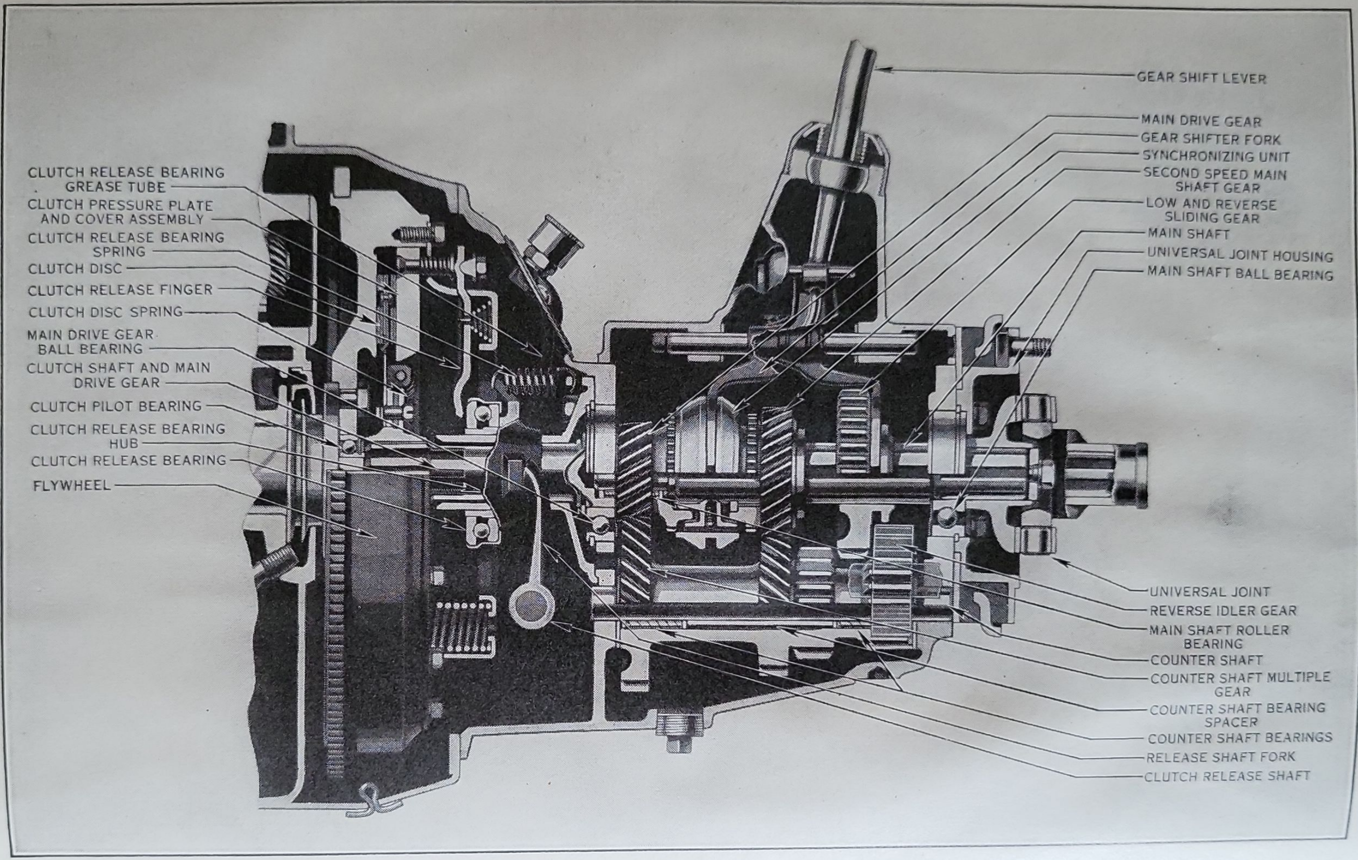
The transmission in the Ford car is of the selective sliding type with silent running constant mesh gears in second speed. All gears used in second speed having helical teeth to insure their quiet operation.

With the gear shift lever in high speed position the drive is direct.

A synchronizer is used to insure quiet and easy gear engagement between high and second gear. Fig. 15 shows the transmission used in the Ford V-8 car. Portions of the case and the gears have been cut away to better illustrate the various gears, synchronizer, bearings, etc., used. The reverse idler gear has been drawn semi-transparent to permit the countershaft reverse gear, which is on the other side of it, to be shown.

The power is transmitted entirely on roller or ball bearings in all forward speeds and, with the exception of the reverse idler gear, in reverse gear also.

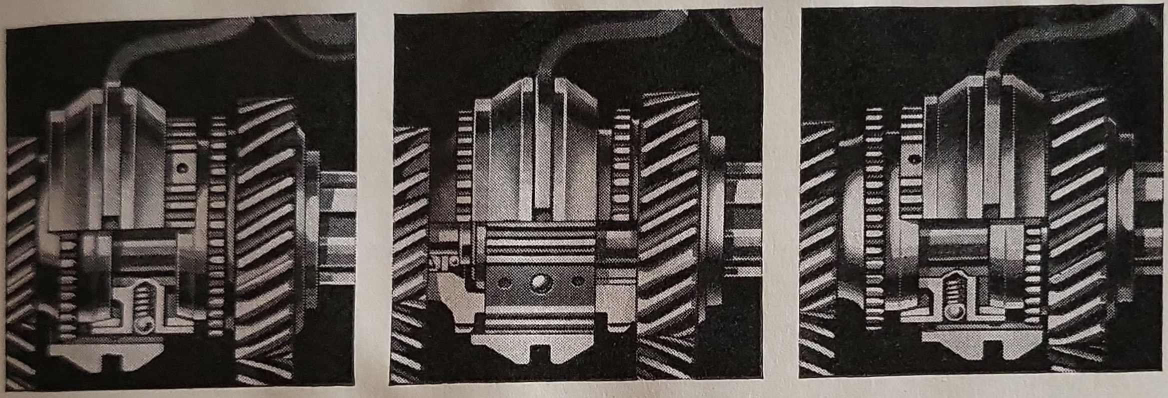
The Synchronizing Device makes shifting smooth, quiet and almost effortless. It consists of a hub and ring. Teeth on the inside of the ring mesh with teeth on the outside of the hub at all times, In neutral position the central location of the ring on



Clutch and Transmission
Figure 15

the hub is maintained by six steel balls held in a groove in the ring by springs. The hub is built with a bronze section on each side which fits the conical steel flange on either second or high gear. When a shift is made to either high or second speed, the synchronizing device moves as a unit until the bronze section of the hub contacts the conical flange of the gear. Acting as a conical clutch the speed of the two is synchronized or made uniform and, as the shift is completed, the internal gear or ring of the synchronizer unit is released from its centrally located position on the hub and the teeth engage in the teeth of the high or second speed gear. As the two are rotating at the same speed the meshing of these gears is effected without clashing of the teeth.

Fig. 16 shows the operating positions of the synchronizer unit in high and second speed drive as well as neutral position.



High **Neutral** **Second**

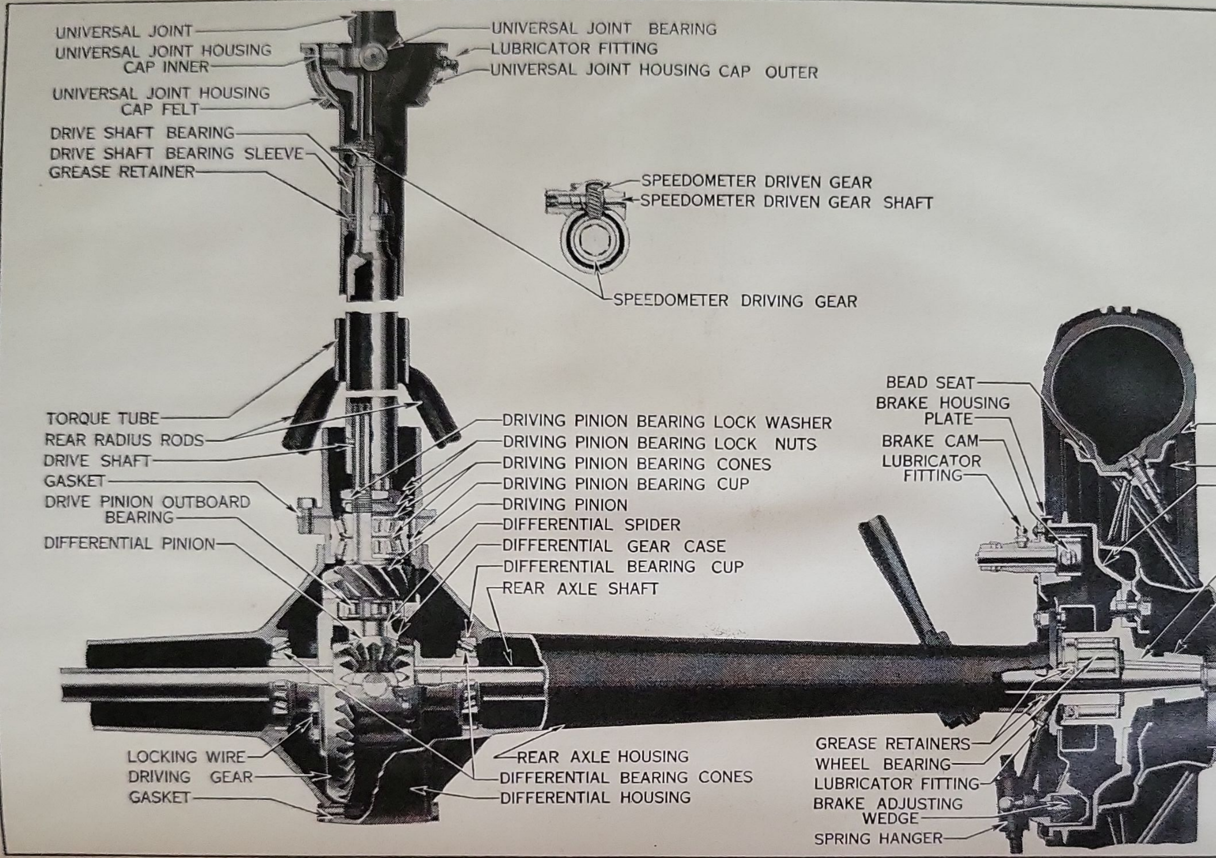
Synchronizing Unit
Figure 16

Care

Only a fluid gear lubricant should be used in the transmission, the level of which should be maintained at the height of the filler plug, located on the right side of the transmission case.

Too high a level of lubricant in the transmission will result in its seepage past the bearings and down the torque tube to the rear axle.

Too low a level will accelerate the wear of the component parts.



Rear Axle
Figure 17

The Rear Axle

The power is transmitted to the rear axle from the transmission by means of a universal joint and a drive shaft running on roller bearings. The load is carried on the axle housing, thus freeing the axle shafts of all strain other than the actual transmission of power. All road thrust is delivered through a torque tube to the frame. Owing to the high degree of accuracy obtained by the use of special Ford developed machinery the various dimensions of the component parts of the axle are held to such fine limits that adjustments are not required. Gear back lash and bearing clearances are permanently correct.

The axle shaft nut which holds the hub in place should be kept tight at all times to prevent damage to the taper on either the axle shaft or hub.

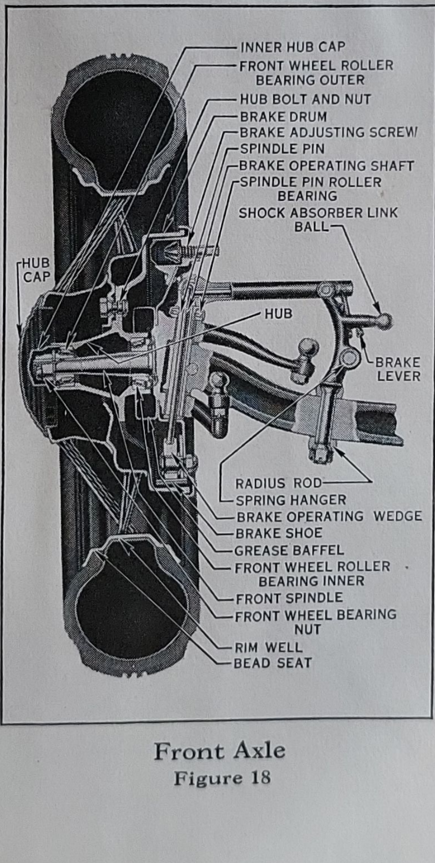
Lubrication of the rear axle is completely covered on pages 17 and 22.

The Front Axle

The front axle of the Ford car is so designed as to afford maximum safety at either high or low speeds on rough roads or pavements. The axle is held in position by radius rods pivoting on the frame cross member. This method of mounting holds the axle in the correct position with regard to brake rods, steering connections, and spindle pin inclination at all times regardless of the road or speed of the car.

In normal service the only attentions required are lubrication and the correct adjustment of the various steering connections. It is recommended that these adjustments when required be made by an authorized Ford dealer.

The front axle should be jacked up periodically and



Front Axle
Figure 18

the front wheels tested for smoothness of running and excessive side play. To determine if there is excessive side play, grasp the sides of the tire and shake the wheel. Do not mistake loose spindle bushings for loose bearings. Insert a wedge between spindle and axle when making this test to take up any spindle bushing play. If the spindle bushings have become worn sufficiently to warrant it, they should be replaced. Consult a Ford dealer.

Adjusting Front Wheel Bearing. If there is excessive play in the bearing it can be adjusted as follows:

Jack up front of car and remove outer hub cap as shown in Fig. 19.

Remove the front wheel.

The inner hub cap may now be removed by turning in a counter-clockwise direction. By removing the cotter key the front wheel bearing nut, bearings and hub may be removed or adjusted.

When reassembling or adjusting the adjusting nut should be run up tight and then turned back approximately ¼ turn and the cotter pin replaced. Both the inner and outer hub caps should again be installed. Never operate the car with the front hub caps missing.

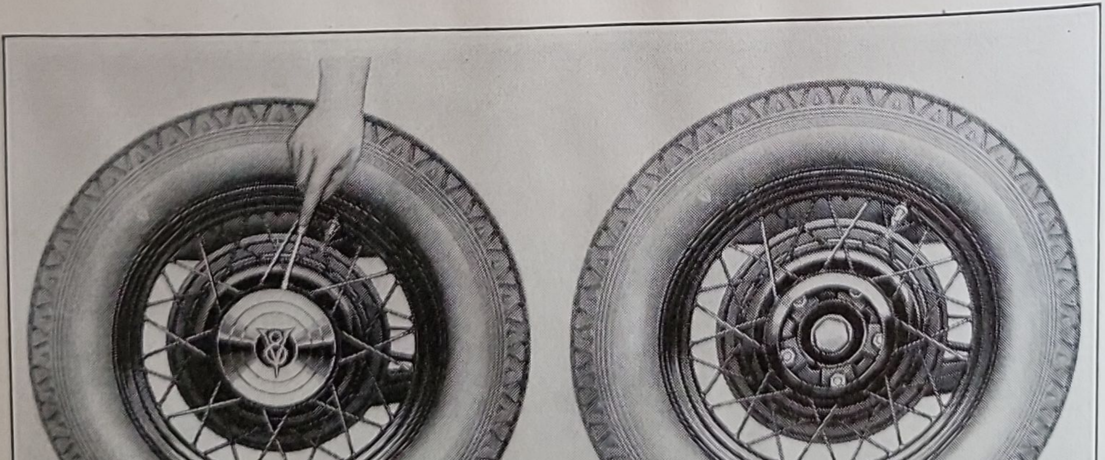


Figure 19

Ford Steel Spoke Drop Center Wheels

The Ford cars are equipped with sturdy steel spoke wheels of accurate balance. The hub, rim, and steel spokes are electrically welded into one piece and require no attention other than correct installation on the hub and the correct installation of the tire so as not to destroy the balance of the wheel.

To remove the wheels jack up the side of the axle from which the wheel is to be removed. With a screw driver remove the hub caps as shown in Fig. 19. With the wrench incorporated in the starting crank remove the five hub bolt nuts. The wheel can then be removed.

When replacing a wheel, tighten each hub bolt nut a few turns at a time. Then follow around the hub, tightening each nut firmly. If nuts are not drawn up evenly, the wheel will not run true.

To Remove Tire

(1) Deflate the tube completely.

(2) Remove the valve cap and valve lock nut.

(3) Loosen both beads from the bead seats.

(4) Force the outside bead from the bead seat into the rim well at a point opposite the valve.

(5) With two tire tools placed approximately four inches on each side of valve lift the bead over the rim flange (see Fig. 20).

(6) Follow around the flange with the tools until the outside bead is free from the rim.

(7) Force the inside bead into the rim well at the top.

(8) Pull out bottom of the tire until it swings clear, as shown in Fig. 20.

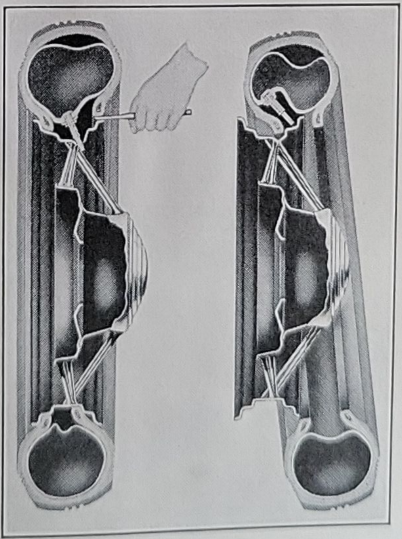
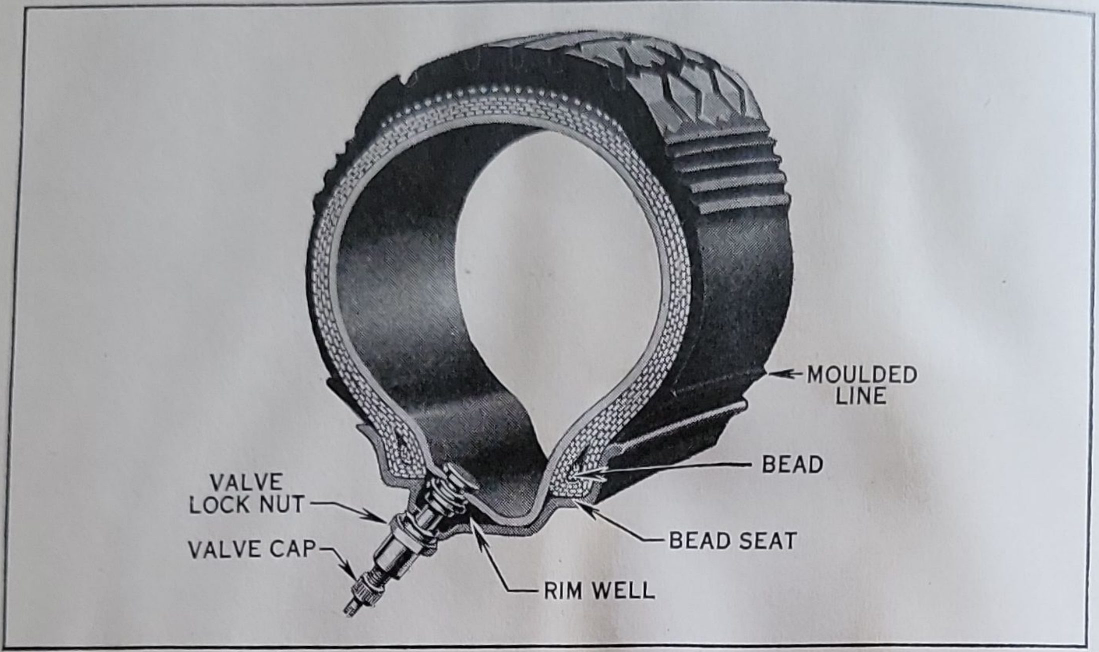


Figure 20



Sectional View of Tire and Rim

Figure 21

To Mount Tire

(1) Inflate the tube until barely rounded out and insert in tire. The tires are marked with a red dot to insure correct balance. The tube must be placed in the tire with the valve stem at point marked.

Caution: Never use a tire flap. Use only tires having balancing dot and moulded line for centering on the wheel.

(2) Place the tire on the wheel, guiding the valve through the valve hole.

(3) Push the inside bead into the rim well at a point next to the valve.

(4) Force the remaining portion of the bead over the outside flange of the rim. If a tire tool is used, do not attempt to force too large a portion over the flange at one time.

(5) Apply the valve lock nut loosely.

(6) Lift up on the tire, placing the outside bead in the rim well at the valve.

(7) Starting at either side of the valve, force short lengths of the bead over the flange, continuing around the wheel until the entire bead is in place. Always keep as much of the bead as possible in the rim well while applying.

(8) Before inflating, remove the valve lock nut and push the valve stem into the casing as far as possible to make certain that the tube is not pinched under the tire bead. Do not let go of the valve stem while doing this.

(9) Reapply rim nut, and inflate the tube to not more than two pounds pressure, working casing back and forth to insure proper setting of the tire. The proper setting is indicated by the moulded line (see Fig. 21) on the tire being equally spaced from the rim at all points.

(10) Inflate the tire to 35 pounds pressure.

With Ford steel spoke wheels, tires can be more easily changed with wheel mounted on axle or tire carrier than by laying the wheel on ground.

Keep Tires Properly Inflated

Tires should never be run partially inflated, as the side walls are unduly bent and the fabric is subjected to stresses which cause what is known as rim cutting. Keep both front and rear tires inflated to 35 pounds, and check the pressure once a week.

The air pressure in the tires has a very pronounced effect on the action of the brakes, as well as the correct operation of the front wheels and steering gear.

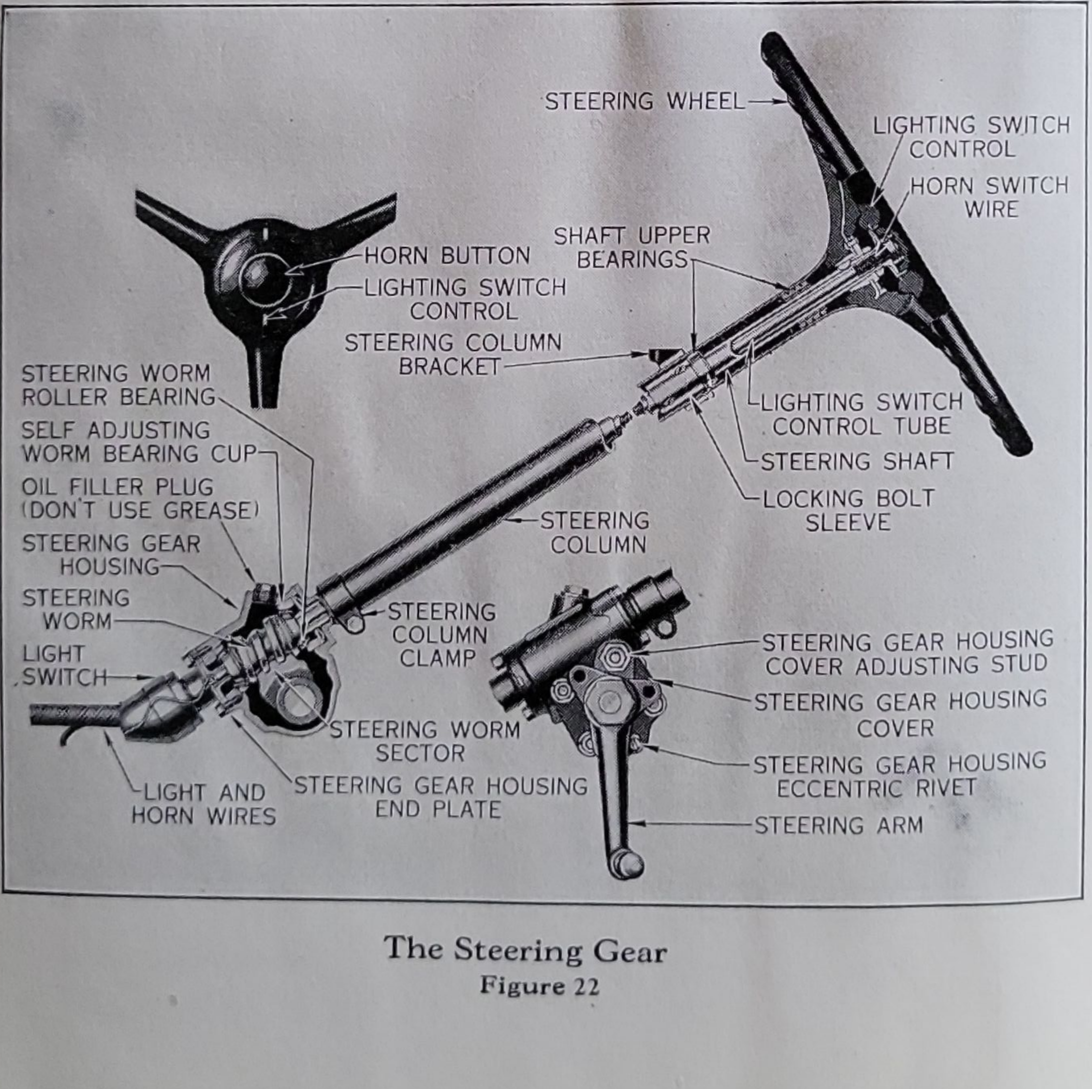
Never run on a flat tire, even for a short distance. Skidding also shortens the life of the tires. Avoid running in street car tracks, or bumping the sides of the tire against the curbing.

The Steering Gear

The steering gear on the Ford car is of the "hour glass" worm and sector type. The worm rotates on self-adjusting tapered roller bearings and requires little attention other than periodic lubrication (see page 17).

Means of adjustment to compensate for wear are provided. These adjustments, however, should not be attempted by the layman, and it is recommended that, when they are required, you consult a Ford dealer.

Improper tire inflation, incorrectly adjusted brakes or incorrect toe-in or wheel bearing adjustment of the front wheels have a very pronounced effect on the steering of the car. These points should be checked before any adjustment of the steering gear is attempted. Your local authorized Ford dealer can quickly diagnose and remedy any difficulty affecting the steering. Do not jeopardize your safety by makeshift adjustments.



The Steering Gear
Figure 22

Brakes

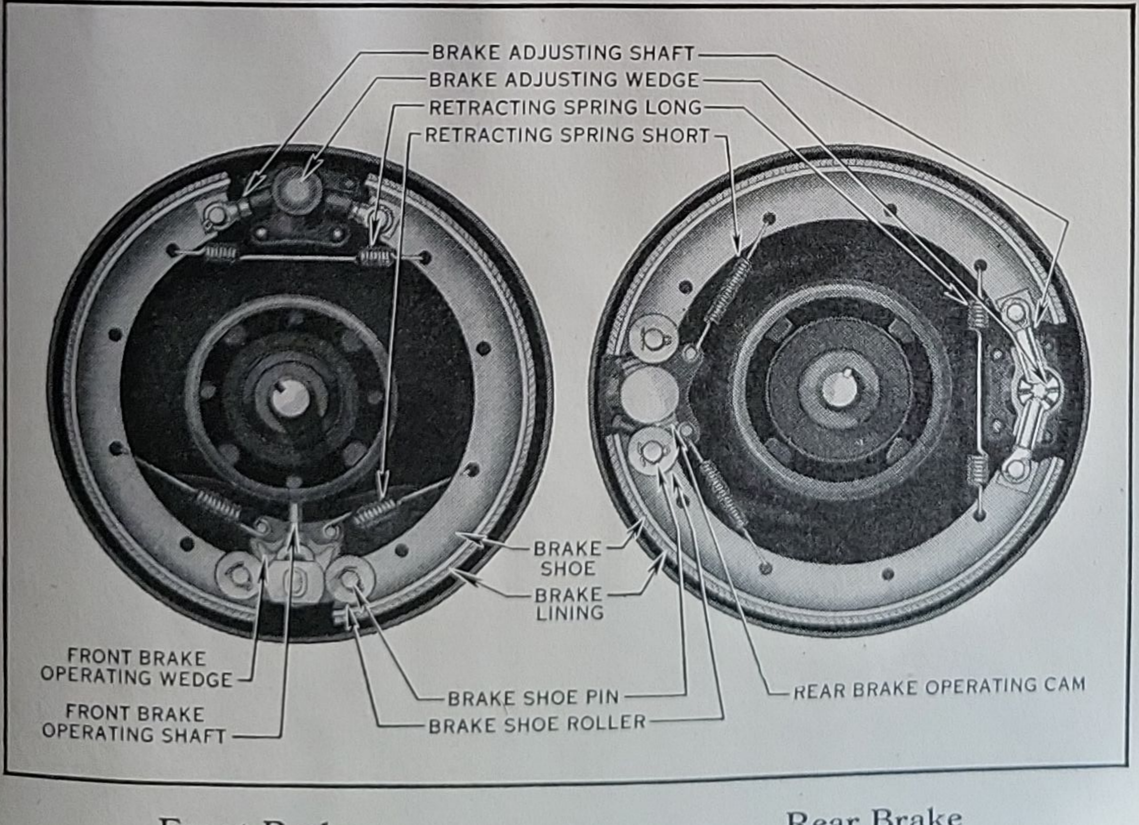
The braking system includes four internal expanding brakes, one at each wheel, operated by the foot brake pedal and the hand brake lever.

The brakes are mechanically operated design of simple construction insuring quiet and positive action and highest efficiency at all times.

Adjusting Brakes

Before attempting to adjust the brakes, equalize the air pressure in the tires.

The most effective method of testing the brakes is by an actual road test. When, with the tires all inflated to 35 pounds pressure, a road test reveals the braking action to be unequal at the various wheels or the pedal travel is to within two inches of the floor board, the brakes should be adjusted. Authorized Ford dealers can make this adjustment correctly and quickly at low cost.



Front Brake Rear Brake

Figure 23

Do not jeopardize your safety by makeshift adjustments.

If a Ford dealer is not available, a temporary adjustment may be made by the screwing in of the adjusting screw provided at each wheel. One or two notches should be enough ordinarily. Always jack up the wheel to see that the brakes do not drag after this adjustment.

Electrical System

The electrical system includes the following equipment:

Storage Battery
Generator
Ammeter
Starting Motor
Lights
Horn
Distributor and Circuit Breaker
Condenser
Ignition Coil
Spark Plugs

The Battery

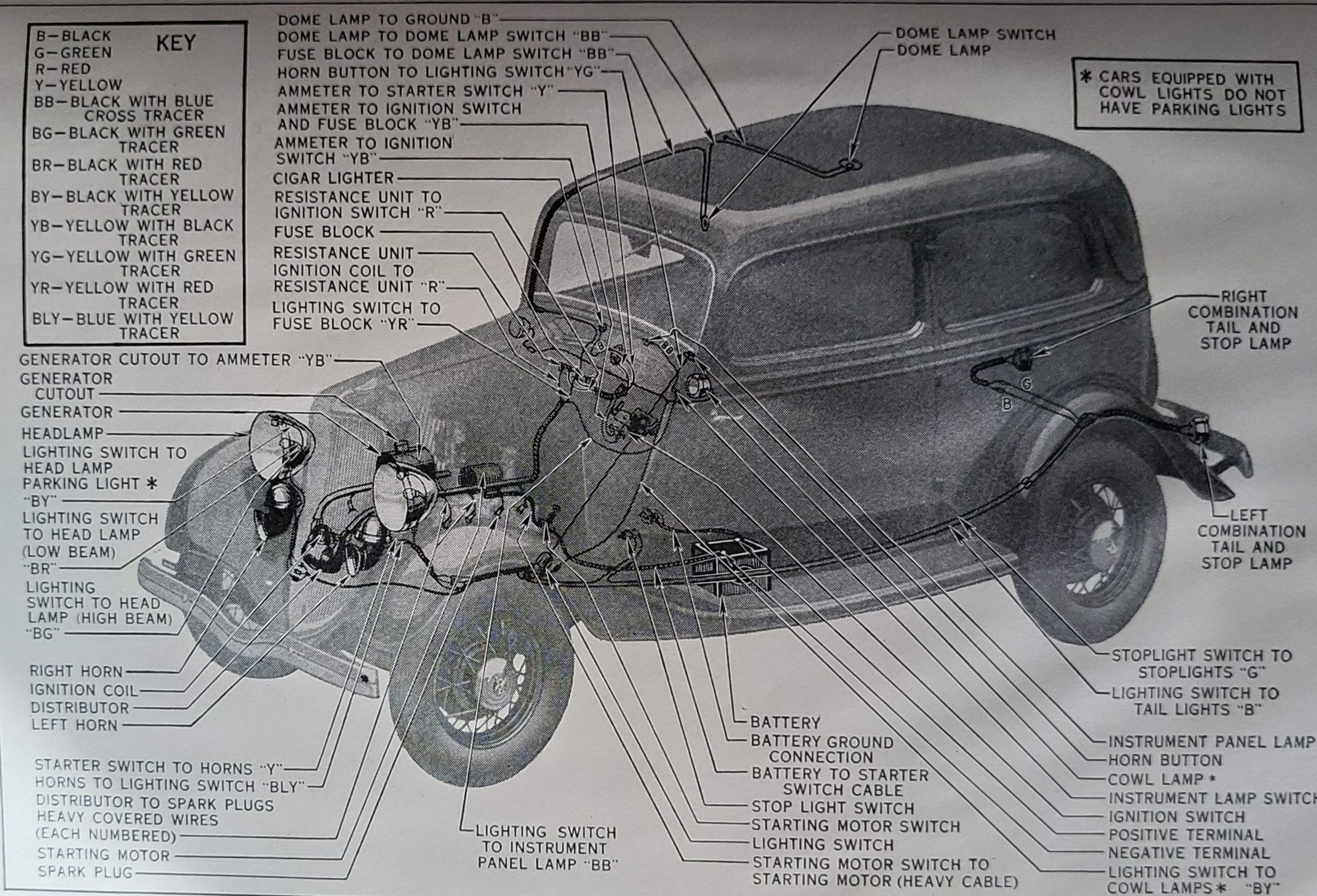
The Ford electrical system uses a six-volt, 80-ampere-hour, 15-plate battery, designed and built to meet the requirements of the Ford car.

Care of the Battery

Every two weeks check the electrolyte in the battery to see that it is at the proper level. The solution (electrolyte) should be maintained at a level with the bottom of the filling tubes. If below this point, add distilled water until the electrolyte reaches the proper level. Water for battery use should be kept in clean, covered vessels of glass, china, rubber or lead. In cold weather add water only immediately before running the engine so that the charging will mix the water and electrolyte and prevent freezing. Access to the battery is easily made by removing a small plate located in the floor board in front of the driver's seat. Excessive use of water by the battery usually is an indication of charging at an excessive rate and the generator charging rate should be readjusted to more nearly conform with your electrical requirements.

Charging of the battery at an excessive rate materially shortens the life of the battery and is to be avoided.

To remove the battery from the car it will be necessary to take out the floor board. When replacing the battery in the car, be sure to install it with the POSITIVE terminal grounded as shown in Fig. 24.


KEY
B—BLACK
G—GREEN
R—RED
Y—YELLOW
BB—BLACK WITH BLUE CROSS TRACER
BG—BLACK WITH GREEN TRACER
BR—BLACK WITH RED TRACER
BY—BLACK WITH YELLOW TRACER
YB—YELLOW WITH BLACK TRACER
YG—YELLOW WITH GREEN TRACER
YR—YELLOW WITH RED TRACER
BLY—BLUE WITH YELLOW TRACER
DOME LAMP TO GROUND "B"
DOME LAMP TO DOME LAMP SWITCH "BB"
FUSE BLOCK TO DOME LAMP SWITCH "BB"
HORN BUTTON TO LIGHTING SWITCH "YG"
AMMETER TO STARTER SWITCH "Y"
AMMETER TO IGNITION SWITCH AND FUSE BLOCK "YB"
AMMETER TO IGNITION SWITCH "YB"
CIGAR LIGHTER
RESISTANCE UNIT TO IGNITION SWITCH "R"
FUSE BLOCK
RESISTANCE UNIT
IGNITION COIL TO RESISTANCE UNIT "R"
LIGHTING SWITCH TO FUSE BLOCK "YR"
DOME LAMP SWITCH
DOME LAMP
* CARS EQUIPPED WITH COWL LIGHTS DO NOT HAVE PARKING LIGHTS
GENERATOR CUTOUT TO AMMETER "YB"
GENERATOR CUTOUT
GENERATOR
HEADLAMP
LIGHTING SWITCH TO HEAD LAMP PARKING LIGHT * "BY"
LIGHTING SWITCH TO HEAD LAMP (LOW BEAM) "BR"
LIGHTING SWITCH TO HEAD LAMP (HIGH BEAM) "BG"
RIGHT HORN
IGNITION COIL
DISTRIBUTOR
LEFT HORN
STARTER SWITCH TO HORNS "Y"
HORNS TO LIGHTING SWITCH "BLY"
DISTRIBUTOR TO SPARK PLUGS HEAVY COVERED WIRES (EACH NUMBERED)
STARTING MOTOR
SPARK PLUG
LIGHTING SWITCH TO INSTRUMENT PANEL LAMP "BB"
BATTERY
BATTERY GROUND CONNECTION
BATTERY TO STARTER SWITCH CABLE
STOP LIGHT SWITCH
STARTING MOTOR SWITCH
LIGHTING SWITCH
STARTING MOTOR SWITCH TO STARTING MOTOR (HEAVY CABLE)
RIGHT COMBINATION TAIL AND STOP LAMP
G
B
LEFT COMBINATION TAIL AND STOP LAMP
STOPLIGHT SWITCH TO STOPLIGHTS "G"
LIGHTING SWITCH TO TAIL LIGHTS "B"
INSTRUMENT PANEL LAMP
HORN BUTTON
COWL LAMP *
INSTRUMENT LAMP SWITCH
IGNITION SWITCH
POSITIVE TERMINAL
NEGATIVE TERMINAL
LIGHTING SWITCH TO COWL LAMPS * "BY"

Electrical System
Figure 24

Loose or corroded battery connections increase the line resistance, raising the voltage of the generator often beyond the capacity of the light bulbs, causing them to burn out, and causing the breaker points to burn and pit.

Keep the battery filling plugs and connections tight, and the top of the battery clean. Wiping the battery with a rag moistened with ammonia will counteract the effect of any of the solution which may be on the outside of the battery. A coating of vaseline will protect the terminals from corrosion. It is of vital importance that the battery is firmly secured in its supporting brackets at all times. If clamps are loose, the battery will shift about in the compartment, resulting in loose connections, broken cells and other trouble. When repairs are necessary, or if the car is to be laid up for the winter, take the battery to a Ford dealer for proper attention and storage. Do not entrust your battery to inexperienced or unskilled hands.

The Generator

The generator is mounted above and to the front of the engine.

The charging rate must be adjusted to suit the individual electrical requirements of each owner. For example, the owner who takes long daylight trips should adjust the charging considerably lower than the owner who makes numerous stops or uses his lights or electrical accessories continually.

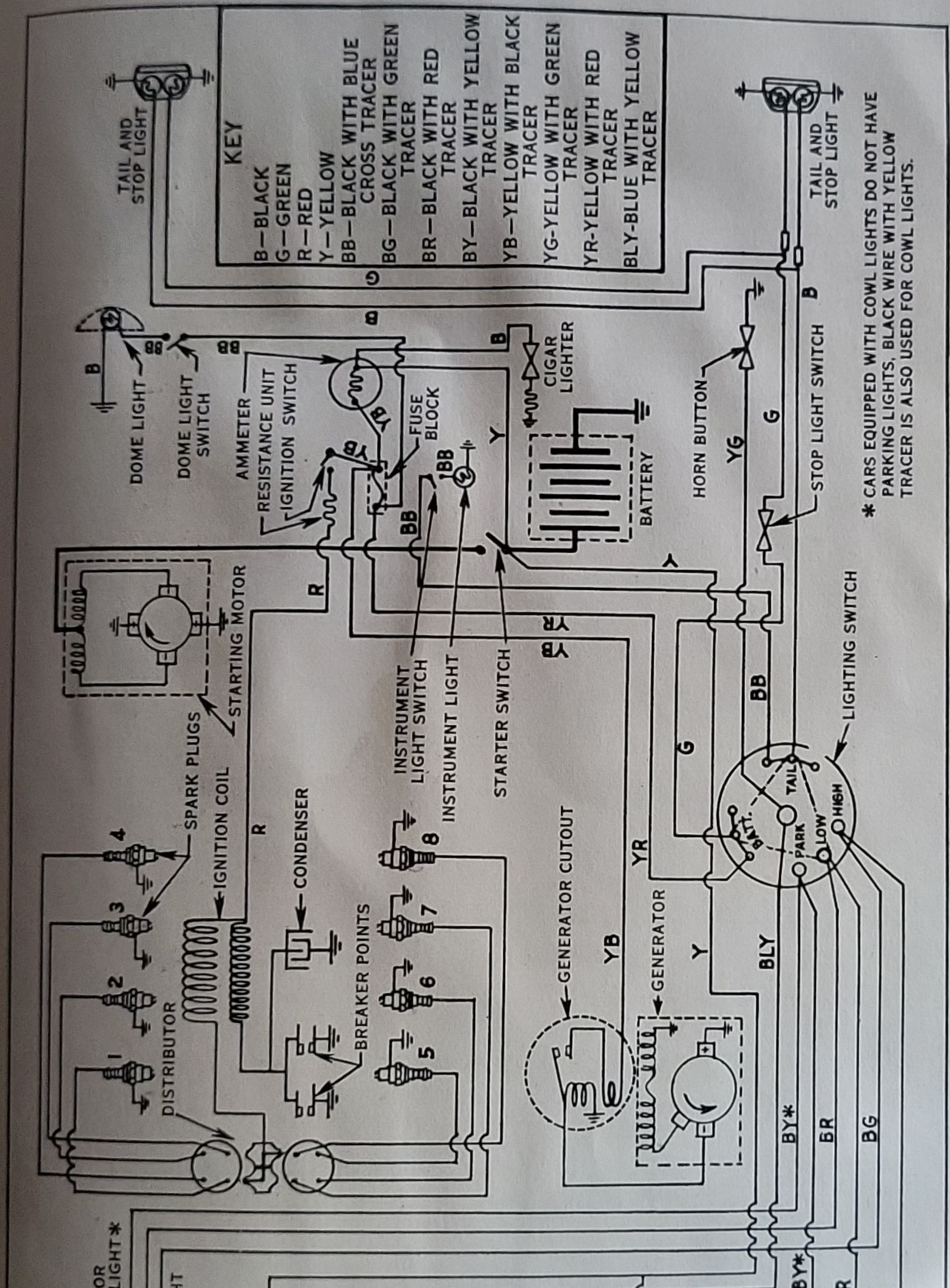
The ideal charging rate is the lowest rate with which full battery charge is maintained. Insist upon your Ford dealer properly adjusting this.

Increasing or Decreasing Generator Charging Rate

To increase or decrease the generator charging rate, remove generator cover and shift the "third" brush (shown in Fig. 8). To increase the charging rate, shift the "third" brush in the direction of rotation; to reduce the rate, shift the brush in the opposite direction. The output of the generator is indicated by the ammeter located on the instrument panel. For average driving the charging rate should not exceed 10 amperes.

The Starting Motor

The starting motor is mounted on the right side of the engine. It requires no attention beyond seeing that the cable connections are clean and tight.



Wiring Diagram
Figure 25

Lights

Operation of the Lights

The lighting system is operated by a switch control, located at the top of the steering wheel (see Fig. 3). When the lighting switch control is pointed straight down, the lights are "off." Turning control first position to right from the "off" position gives a downward tilting beam for city driving. Turning control to second position to right provides a beam which gives exceptionally brilliant road illumination for country driving. Turning the control all the way to the left turns on the parking lights.

Light Fuse

Should the lamps fail to light when the switch is placed in any of the "on" positions, examine the fuse located on rear of dash in front of the instrument panel (see Fig. 24). If the fuse is burned out an examination of the various wiring connections is advisable before it is replaced. Consult an authorized Ford dealer.

Replacing the Bulbs

When replacing burned out bulbs, make certain that you get genuine Ford bulbs. Genuine Ford bulbs have the name "FORD" marked on the base. They insure your headlights meeting the lighting requirements of the various states.

Headlight Requirements

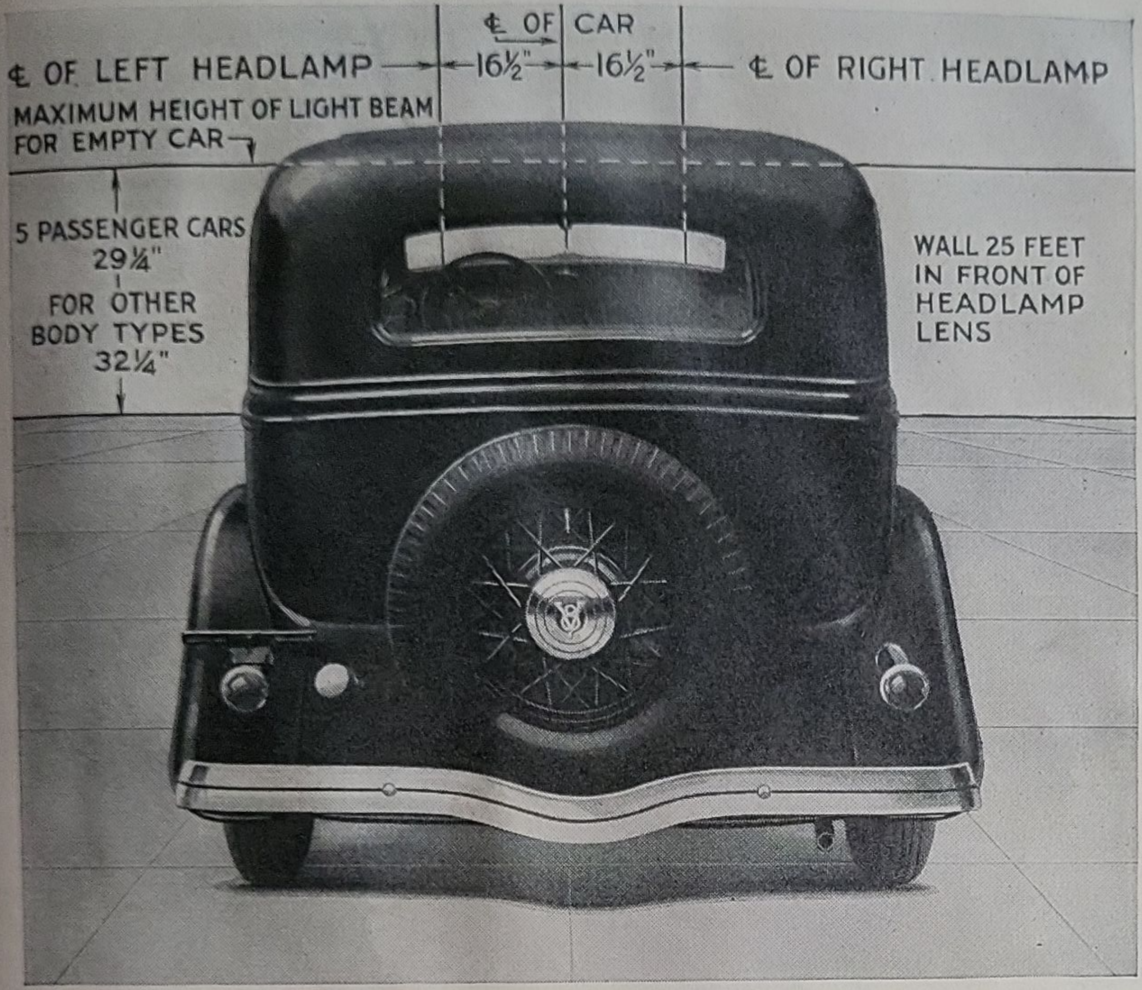
When the car is delivered, the headlamps are properly focused and aligned, and will pass the lighting requirements of all states.

The focusing of the lights is a permanently built in feature of the Ford headlights, requiring no attention. The focus will remain fixed as long as accurately built bulbs are used.

Should the lamps get out of alignment, they should immediately be realigned. Ford dealers are equipped for this service.

Aligning Headlamps

Position the car on a level surface in front of a white wall or screen, 25 feet from front of headlamps as shown in Fig. 26. The center line of the car should be at 90 degrees (right angles) from the wall. This wall must be in semi-darkness or sufficiently shielded from direct light so that the light spots from the headlamps can be clearly seen. The wall must be marked off with black lines, as follows:


℄ OF CAR
℄ OF LEFT HEADLAMP
16½"
16½"
℄ OF RIGHT HEADLAMP
MAXIMUM HEIGHT OF LIGHT BEAM FOR EMPTY CAR
5 PASSENGER CARS 29¼"
FOR OTHER BODY TYPES 32¼"
WALL 25 FEET IN FRONT OF HEADLAMP LENS

Layout for Aligning Lights
Figure 26

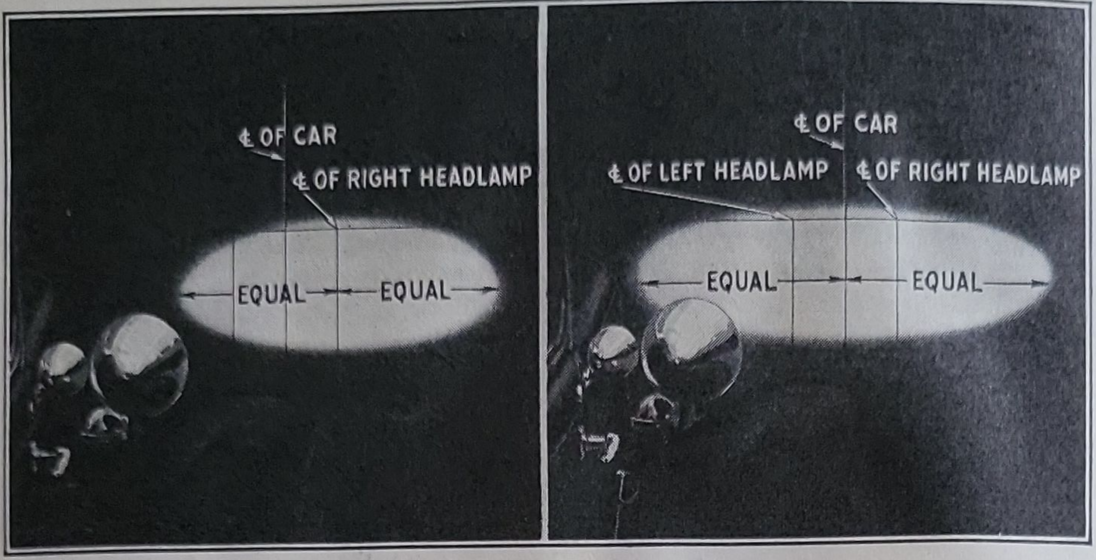
Sighting through the center of the rear window establish a vertical line on the wall in line with the radiator cap as shown in Fig. 26 (see center line of car).

Establish two additional vertical lines on the wall. These lines represent the center lines of the two headlamps and should be exactly 33 inches apart, each being 16½ inches from the line representing the center line of the car (see Fig. 26).

Establish one horizontal line on the wall as shown in Fig. 26.

For 5-passenger cars this line should be 29¼ inches above the level of the surface on which the car stands.

For all other body types the horizontal line should be 32¼ inches above the level of the surface on which the car stands.



Right Headlamp Properly Aligned

Both Headlamps Properly Aligned

Figure 27

Headlamps may be aligned by moving lamps after nut at bottom of bracket has been slightly loosened.

The beam of light from each headlamp is to extend straight forward, that is, the centers of the elliptical spots of light must be 33 inches apart as shown in Figs. 26 and 27.

The lamps should be set so that the top of the bright spots will be at the horizontal line on the wall with the car empty (see Fig. 27).

With tops of bright spots thus set for empty car the headlamps comply, under all conditions of loading, with the requirements of nearly all states. Consult your local Ford dealer.

Engine Ignition

The current for igniting the gas mixture in the cylinders is provided by the storage battery. The ignition coil transforms the low tension current to a high tension current of sufficient voltage to bridge the gap between the points of the spark plugs. The circuit breaker points interrupt the flow of low tension current at regular intervals, while the distributor rotor distributes the high tension current to each spark plug in proper firing order.

Distributor and Circuit Breaker

The distributor used on the Ford V-8 is located at the front of the engine and is driven direct by the camshaft, thus eliminating many parts.

The spark timing is automatically retarded by the centrifugal governor weight springs for starting. By means of this centrifugal governor, the spark is automatically advanced at increased engine speeds in direct proportion to the speed.

The spark timing is automatically retarded by the vacuum brake under load in direct proportion to the load.

Vacuum Brake

The vacuum brake consists of a plunger or piston which is held against the braking surface of the governor plate by a spring of adjustable tension. As the rapidity of combustion is dependent on the degree of compression, the need of a retarded spark for quick acceleration or power is not dependent entirely on engine speed.

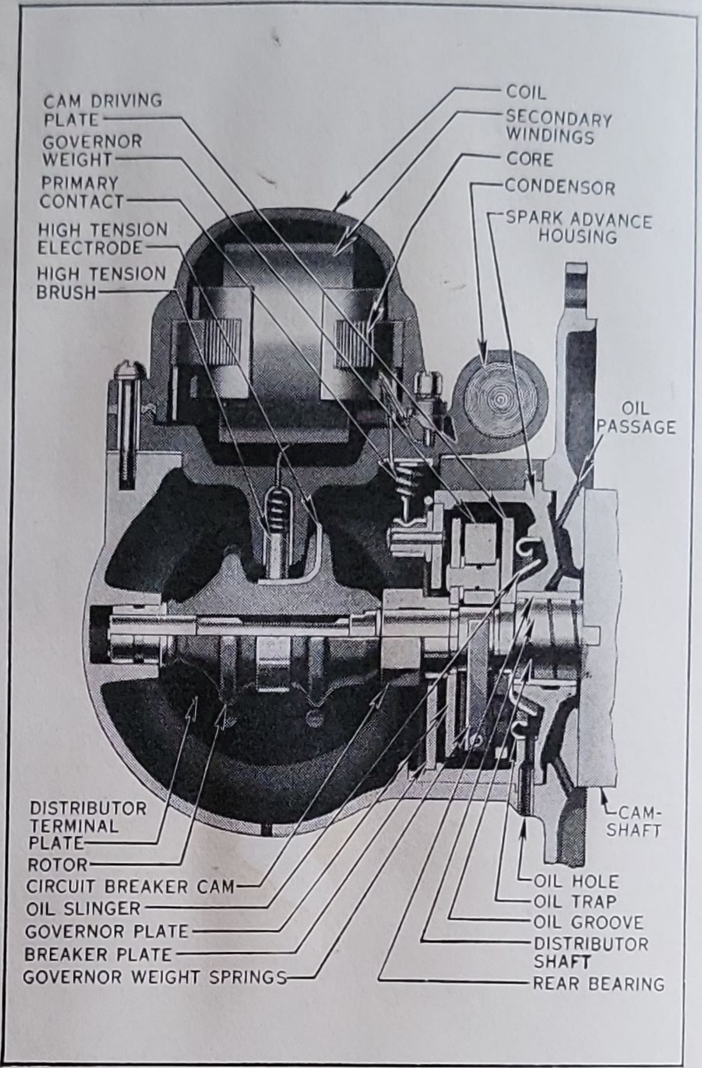
Spark Plugs

The spark plugs with which Ford engines are fitted when they leave the factory are best adapted to the requirements of the Ford engine. The gap between the points should be .025 inch.

Distributor Adjustment

The highly efficient ignition system on the Ford 8-cylinder cars should be adjusted only by Ford factory trained mechanics. No other one thing affects the operation of a car as vitally as incorrectly adjusted ignition which reflects in poor performance, high fuel consumption and overheating of engine.

Trouble



Sectional View of Distributor
Figure 28

The best assurance against trouble on the road is the periodical checking of the ignition system by an authorized Ford dealer.

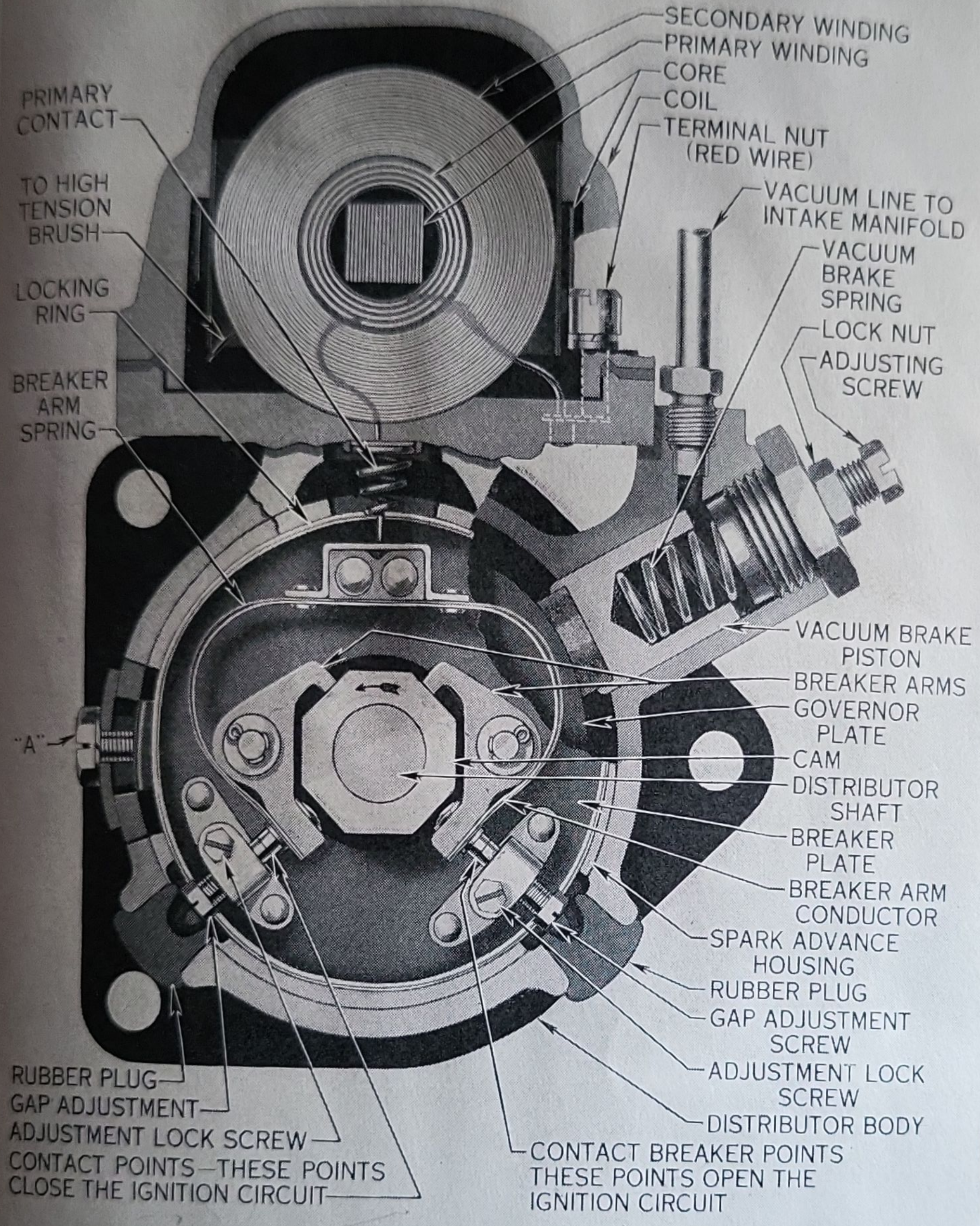
However, should trouble be experienced, which by the process of elimination as covered on page 26 appears to be the result of faulty ignition, if an authorized Ford dealer's service is not available, the following procedure will assist in correcting it:

(1) Disconnect the red wire from the coil terminal nut (see Fig. 29).

(2) Turn ignition switch to "ON" position.

(3) Momentarily touch disconnected wire to cylinder. If spark does not occur, using Figs. 24 and 25 as a guide, check each wire and connection, back through the battery to the battery ground for a break in the circuit.

(4) If spark occurs when the ignition switch to coil wire is grounded to the cylinder and no spark is noted at plugs as outlined on page 26, remove the distributor side covers and terminal plates and examine the breaker points (see Fig. 29). If the points are worn, pitted or burned, the breaker points and the condenser should be replaced (badly burned breaker points are usually an indication of a faulty condenser or a poor battery connection). If the points are incorrectly spaced, adjust the gap to .012 to .014 inch with fiber breaker arm on the high point of the cam. Allow an authorized Ford dealer to check your adjustment.



Circuit Breaker and Coil
Figure 29

(5) If the trouble has not been corrected remove the distributor terminal plates and side covers. Turn on ignition switch. Ground a wooden-handled screwdriver to the distributor body, holding the end of the screwdriver blade approximately 3/8 inch from the metal band around the center of the rotor (see Fig. 28).

When the engine is cranked a spark should occur between the rotor and the screwdriver. If a 3/8 inch spark occurs regularly, further tests of the primary circuit and the coil can be eliminated.

If a spark of less than 3/8 inch only can be obtained the trouble is likely to be that the rotor, condenser or coil is shorted.

If no spark is noted the primary circuit is not completed at some point within the distributor. The primary circuit within the distributor may be traced by referring to Fig. 29.

If a satisfactory spark is obtained at the rotor and no spark is noted at the plugs, the spark plug wires, terminal plates or distributor side covers are shorted, probably due to the engine having been operated at sometime with one of the spark plug wires disconnected from either the spark plug or the terminal plate. To isolate the part at fault: while the engine is cranked hold in turn each spark plug wire (spark plug end) 3/8 inch away from the cylinder head. Any wire from which the spark bridges this 3/8 inch gap is satisfactory and can be eliminated from further tests. Any wires failing to meet this test should not be condemned until terminal plates and side covers are examined for evidence of leakage and no such evidence is found.

(6) Check the gap between the spark plug points. Clean the plugs and adjust gap to .025 inch.

Timing the Engine

Means of adjusting the timing of the ignition to meet the requirements of the fuel used and the type of service in which the car is operated has been provided (see "A", Fig. 29).

To advance the spark, move the screw up (see "A", Fig. 29). Be sure to tighten lock screw after this adjustment.

Shock Absorbers

Ford hydraulic double-acting shock absorbers operate entirely on the principle of hydraulic resistance. Shock absorber fluid is forced from one chamber to another by the movement of the lever arm. The working chamber is automatically kept full by the shock absorber fluid in the reservoir.

The shock absorbers are provided with thermostatic valves which automatically open or close to maintain the resistance required for the necessary snubbing action of the shock absorber. Automatically changing the size of the passage through which the fluid must pass to compensate for the change in the viscosity of the fluid under various temperatures.

In addition to the thermostatic control, another automatic feature has been incorporated in the Ford shock absorber by means of which the shock absorbers instantly and automatically adjust themselves to the condition of the road. This is accomplished by a simple but ingenious valve arrangement which works entirely independent of the thermostatic valve.

When the car is operated over pavements, the action of the shock absorbers is slight, and little resistance is required. However, should the car pass over a bad bump in the road, the fluid would be forced through the valve rapidly. The impact of this rapidly travelling fluid automatically adjusts the valve, thus increasing the resistance when, and to the degree, required, effectively adjusting the shock absorbers to instantly meet the road conditions encountered. As soon as the rapid movement of the fluid is stopped, the valve again automatically opens until such time as increased resistance is again required. By this arrangement the driver is relieved of all worry as to what the correct adjustment should be for any particular road condition.

Care

The only care the shock absorbers require is replenishing the shock absorber fluid in the reservoir. The filler plug in the reservoir should be removed periodically, preferably each fall and spring or at intervals of 5,000 miles, whichever occurs first, and the reservoir filled with Ford shock absorber fluid. Ford dealers are equipped to render this service.

Grease or oil should never be added to the shock absorbers.

The Body

The Proper Way to Wash the Car

Always use cold or lukewarm water—never hot water. If a hose is used, don't turn the water on at full force as this drives the dirt into the finish. After the surplus dirt has been washed off, take a sponge and clean the body and running gear with a solution of water and linseed oil soap. Rinse off with cold water; then rub and polish the body with a damp chamois skin. A body polish of good quality may be used to add lustre to the car. The use of Lincoln body polish is recommended. This polish, developed for use on Lincoln cars, is available through Ford dealers. Grease on the running gear may be removed with a cloth or sponge moistened with gasoline. The bright parts should be polished with a good nickel polish. An excellent nickel polish can also be purchased from any Ford dealer.

Should the body or other pyroxylin finished parts of the car become spattered with tar or other substances used on roads, the spots can be removed with a solution of ⅔ gasoline and ⅓ engine oil.

Dip a soft cloth into the mixture and, using one finger, rub the spot gently until it has been removed. The rubbed spot should then be rinsed with clear water.

Care of the Top

The application of Ford top dressing will greatly improve the appearance of an old top on either an open or closed car. However, **top dressing should never be applied to the top when new** or before the top material starts to check.

When putting down the top on open cars, be careful in folding to see that the fabric is not pinched between the bows, as they will chafe a hole through the top very quickly.

Storing Car

Drain the water from the radiator, then put in about a quart of anti-freeze solution to prevent freezing of any water that may possibly remain. Draw off all gasoline. Drain the old oil from the oil pan. Refill the oil pan with one gallon of fresh oil and run the engine enough to cover the different parts with oil. Remove the tires and store them. Wash the car and if possible cover the body with a sheet of muslin to protect the finish. The battery should be recharged once each month while car is stored.

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Memorandum

Your dealer will fill in the following information about your car on request.

Owner's Name..

Address...

Phone..

Dealer's Name...

Address...

Dealer's Phone..

Engine Number..

Delivery Date..

Body Type Number..

Door Key Number..

Coincidental Lock Key Number...

Deck Door Key Number...

Spare Wheel Lock Key Number...

Tire Serial Numbers... ....

....

Car Title Number...

Driver's License Number...

Car License Number...

Insured By...

Phone..

Policy Number...

Expires...

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